

Registry / Marpat

Krishnan 10/821631

03/10/2006

=> file registry

FILE 'REGISTRY' ENTERED AT 15:11:32 ON 10 MAR 2006

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Property values tagged with IC are from the ZIC/VINITI data file provided by InfoChem.

STRUCTURE FILE UPDATES: 9 MAR 2006 HIGHEST RN 876338-69-1

DICTIONARY FILE UPDATES: 9 MAR 2006 HIGHEST RN 876338-69-1

New CAS Information Use Policies, enter HELP USAGETERMS for details.

TSCA INFORMATION NOW CURRENT THROUGH January 6, 2006

Please note that search-term pricing does apply when conducting SmartSELECT searches.

*
* The CA roles and document type information have been removed from *
* the IDE default display format and the ED field has been added, *
* effective March 20, 2005. A new display format, IDERL, is now *
* available and contains the CA role and document type information. *
*

Structure search iteration limits have been increased. See HELP SLIMITS for details.

REGISTRY includes numerically searchable data for experimental and predicted properties as well as tags indicating availability of experimental property data in the original document. For information on property searching in REGISTRY, refer to:

<http://www.cas.org/ONLINE/UG/regprops.html>

=> file caplus

FILE 'CAPLUS' ENTERED AT 15:11:35 ON 10 MAR 2006

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FILE COVERS 1907 - 10 Mar 2006 VOL 144 ISS 12

FILE LAST UPDATED: 9 Mar 2006 (20060309/ED)

Effective October 17, 2005, revised CAS Information Use Policies apply.

They are available for your review at:

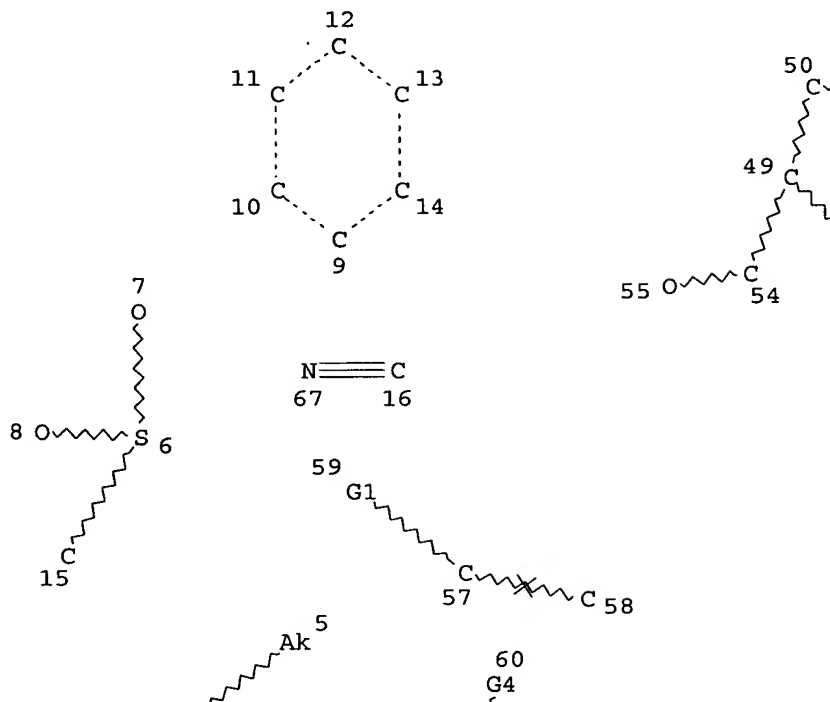
<http://www.cas.org/infopolicy.html>

'OBI' IS DEFAULT SEARCH FIELD FOR 'CAPLUS' FILE

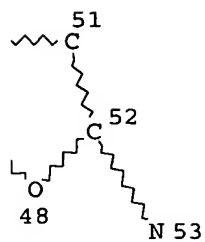
=> d stat que L9

L6 STR

O 68 S 69

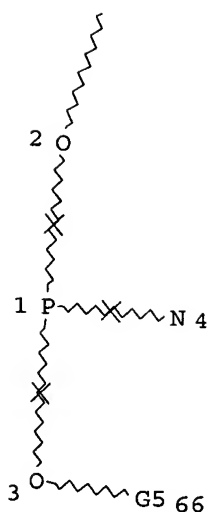
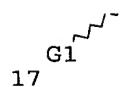


Page 1-A



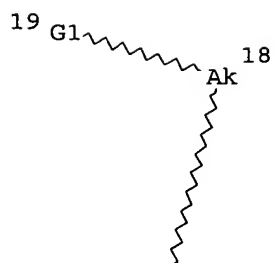
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Page 1-B

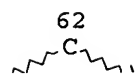


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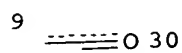
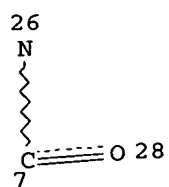
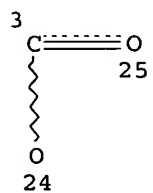
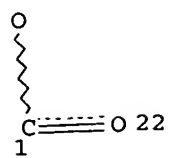
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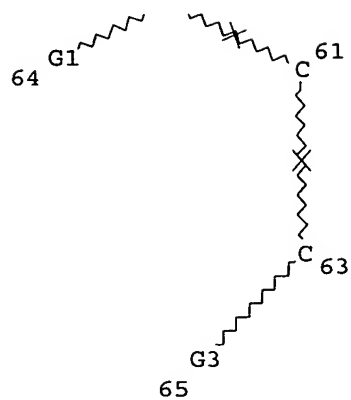
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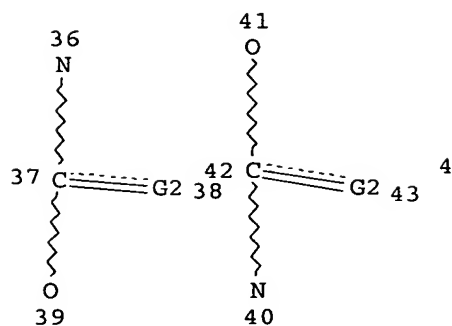
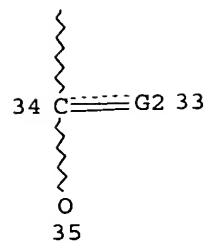
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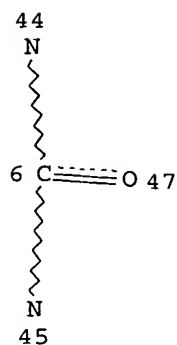
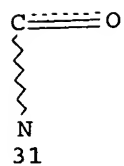
Page 2-B



G3
56



Page 3-A



Page 3-B

VAR G1=6/13/16

VAR G2=68/69

VAR G3=20/23/26/29/32/36/41/44

VAR G4=5/58

VAR G5=18/61

NODE ATTRIBUTES:

NSPEC	IS RC	AT	1
NSPEC	IS RC	AT	2
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NSPEC	IS RC	AT	4
NSPEC	IS C	AT	5
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NSPEC IS RC AT 62
NSPEC IS RC AT 63
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NSPEC IS C AT 65
NSPEC IS C AT 66
NSPEC IS C AT 67

DEFAULT MLEVEL IS ATOM

MLEVEL IS CLASS AT 1 2 3 4 5 6 7 8 15 16 18 20 21 22 23 24 25
26 27 28 29 30 31 32 34 35 36 37 39 40 41 42 44 45 46 47 54 55
57 58 61 62 63 67 68 69

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 69

STEREO ATTRIBUTES: NONE

L8 22 SEA FILE=REGISTRY SSS FUL L6

L9 2 SEA FILE=CAPLUS ABB=ON PLU=ON L8

=> file marpat

FILE 'MARPAT' ENTERED AT 15:11:59 ON 10 MAR 2006

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FILE CONTENT: 1969-PRESENT VOL 144 ISS 10 (20060303/ED)

SOME MARPAT RECORDS ARE DERIVED FROM INPI DATA FOR 1969-1987

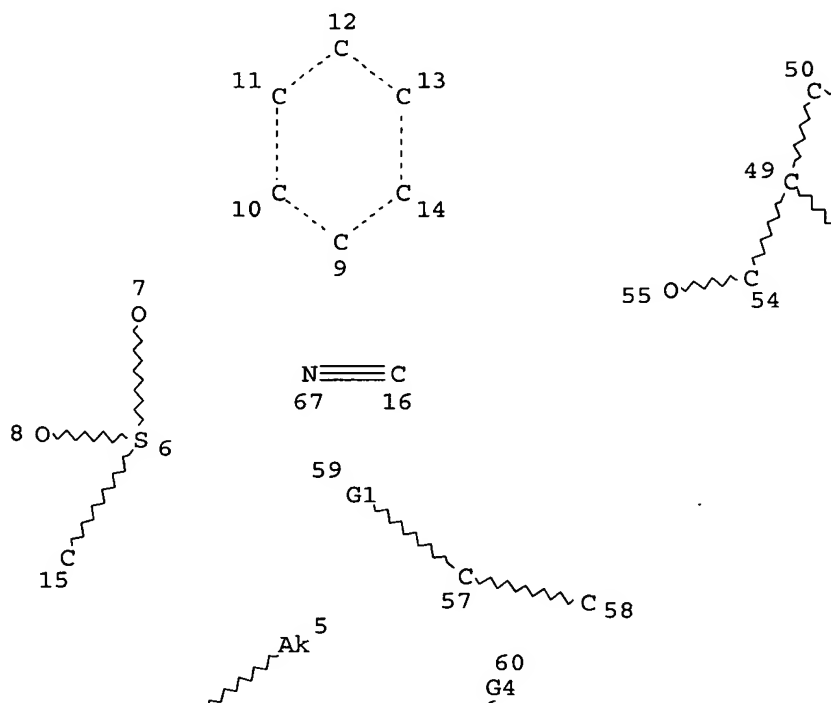
MOST RECENT CITATIONS FOR PATENTS FROM MAJOR ISSUING AGENCIES
(COVERAGE TO THESE DATES IS NOT COMPLETE):

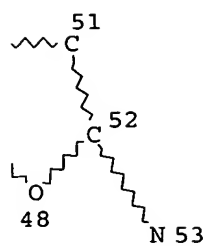
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DE	202005014897	22	DEC	2005
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WO	2006003494	12	JAN	2006
GB	2415429	28	DEC	2005
FR	2871802	23	DEC	2005
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CA	2495134	23	DEC	2005

Expanded G-group definition display now available.

New CAS Information Use Policies, enter HELP USAGETERMS for details.

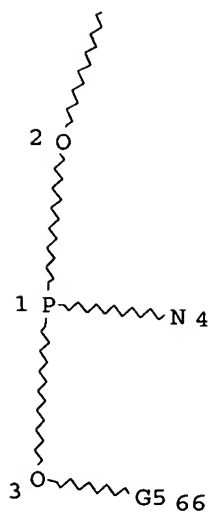
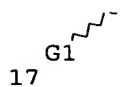
=> d stat que L16
L13 STR
O 68 S 69





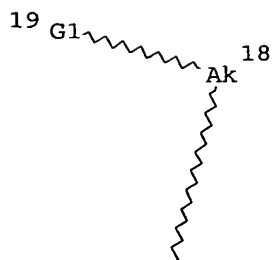
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Page 1-B

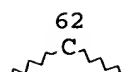


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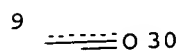
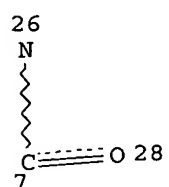
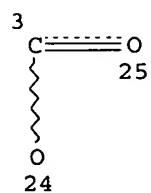
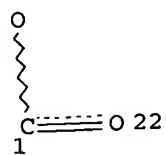
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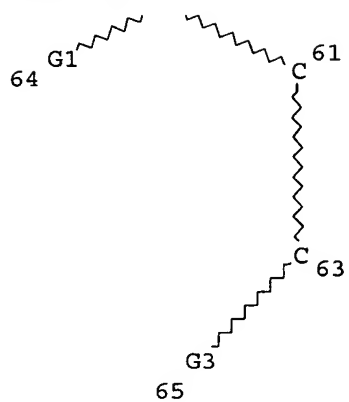
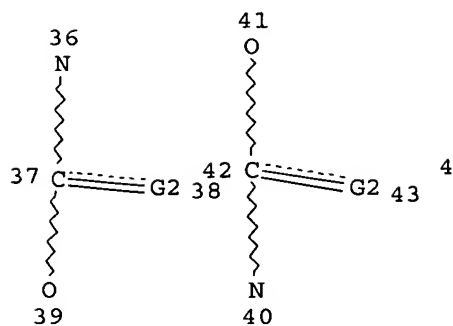
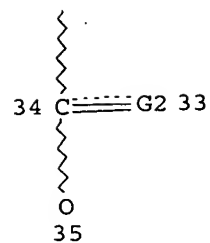
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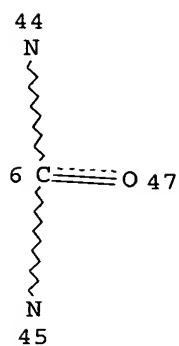
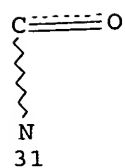
Page 2-A



Page 2-B

G3
56

Page 3-A



Page 3-B

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VAR G2=68/69

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NSPEC	IS C	AT	6
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NSPEC IS C AT 66
NSPEC IS C AT 67
DEFAULT MLEVEL IS ATOM
MLEVEL IS CLASS AT 5 7 8 15 16 18 34 37 42 44 54 57 58 61 62 63 67
68 69
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 69

STEREO ATTRIBUTES: NONE
L16 4 SEA FILE=MARPAT SSS FUL L13

100.0% PROCESSED 729 ITERATIONS 4 ANSWERS
SEARCH TIME: 00.00.29

=> dup rem L9 L16
FILE 'CAPLUS' ENTERED AT 15:12:12 ON 10 MAR 2006

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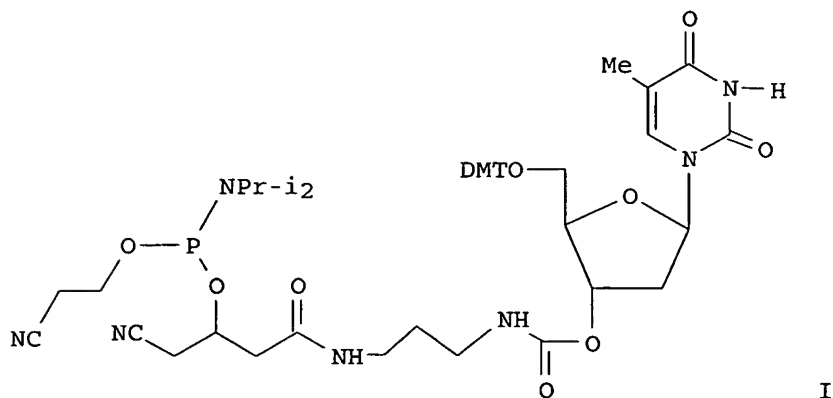
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USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
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PROCESSING COMPLETED FOR L9
PROCESSING COMPLETED FOR L16
L23 5 DUP REM L9 L16 (1 DUPLICATE REMOVED)
ANSWERS '1-2' FROM FILE CAPLUS
ANSWERS '3-5' FROM FILE MARPAT

=> d ibib abs hitstr L23 1-2; d ibib abs hit L23 3-5

L23 ANSWER 1 OF 5 CAPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 1
ACCESSION NUMBER: 2004:999708 CAPLUS
DOCUMENT NUMBER: 141:424386
TITLE: Novel phosphorylation reagents for improved processes
to convert terminal-hydroxyl groups of
oligonucleotides into phosphate mono-esters
INVENTOR(S): Vagle, Kurt; Leuck, Michael; Wolter, Andreas
PATENT ASSIGNEE(S): Proligo, Llc, USA
SOURCE: U.S. Pat. Appl. Publ., 19 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004230047	A1	20041118	US 2004-821631	20040409
PRIORITY APPLN. INFO.:			US 2003-461730P	P 20030409
OTHER SOURCE(S):	MARPAT	141:424386		

GI



AB The present invention discloses novel phosphoramidite reagents for use in

oligonucleotide synthesis. The present invention further discloses novel methods for the conversion of terminal hydroxyl groups of oligonucleotides into phosphate mono-esters. By employing novel reagents, as also disclosed herein, the methods are fully compatible with standard procedures for solid phase oligonucleotide synthesis and do not require addnl. processing steps. The inventive reagents to phosphorylate terminal hydroxyl groups of oligonucleotides are superior to the prior art in that they for the first time combine the desired attributes of being a solid compound for facile handling, comprising two β -eliminating protective groups removable as fast or faster than the standard cyanoethyl group, providing a DMT-group for easy monitoring of the coupling efficiency, and enabling a fast final deprotection of the phosphorylated oligonucleotide without any extra manipulation steps. Thus nucleoside phosphoramidites I was prepared in synthesis of oligodeoxyribonucleotides.

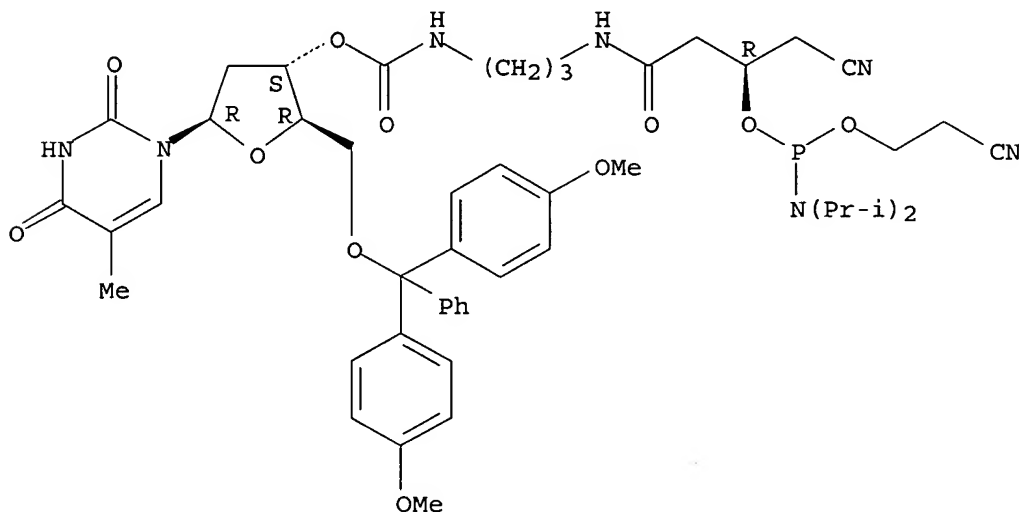
IT 669013-14-3P 794520-43-7P 794520-44-8P
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 794520-51-7P 794520-52-8P 794520-53-9P
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 794520-57-3P 794520-58-4P 794520-59-5P
 794520-60-8P 794520-61-9P 794520-62-0P
 794520-63-1P.

RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
 (phosphorylation reagents for improved processes to convert terminal-hydroxyl groups of oligonucleotides into phosphate mono-esters)

RN 669013-14-3 CAPLUS

CN Thymidine, 5'-O-[bis(4-methoxyphenyl)phenylmethyl]-, 3'-[(9R)-11-[bis(1-methylethyl)amino]-14-cyano-9-(cyanomethyl)-7-oxo-10,12-dioxo-2,6-diaza-11-phosphatetradecanoate] (9CI) (CA INDEX NAME)

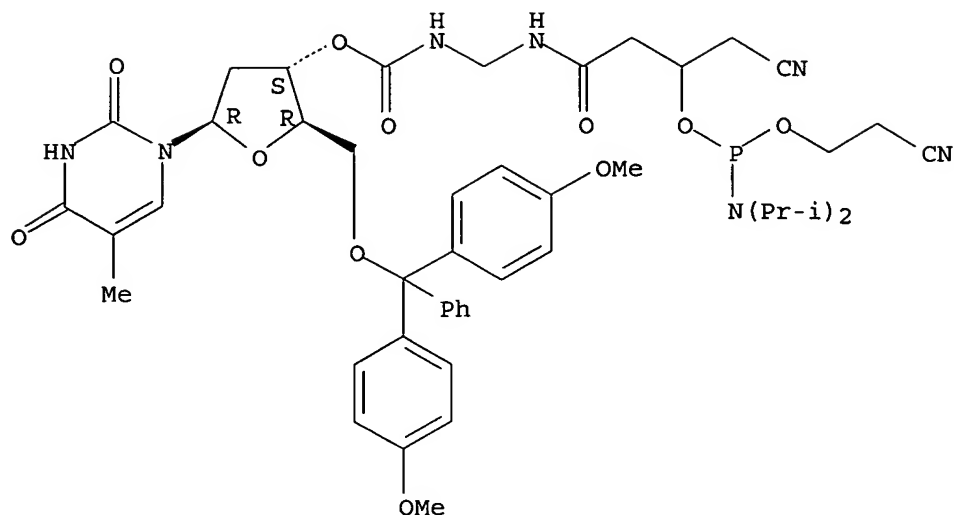
Absolute stereochemistry.



RN 794520-43-7 CAPLUS

CN Thymidine, 5'-O-[bis(4-methoxyphenyl)phenylmethyl]-, 3'-[9-[bis(1-methylethyl)amino]-12-cyano-7-(cyanomethyl)-5-oxo-8,10-dioxo-2,4-diaza-9-phosphadodecanoate] (9CI) (CA INDEX NAME)

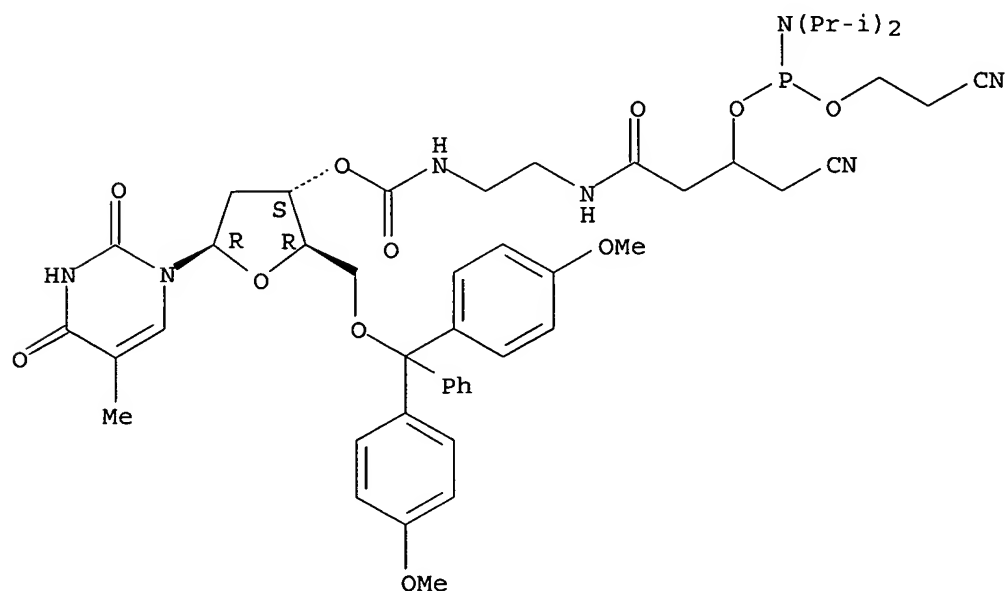
Absolute stereochemistry.



RN 794520-44-8 CAPLUS

CN Thymidine, 5'-O-[bis(4-methoxyphenyl)phenylmethyl]-, 3'-[10-[bis(1-methylethyl)amino]-13-cyano-8-(cyanomethyl)-6-oxo-9,11-dioxo-2,5-diaza-10-phosphatridecanoate] (9CI) (CA INDEX NAME)

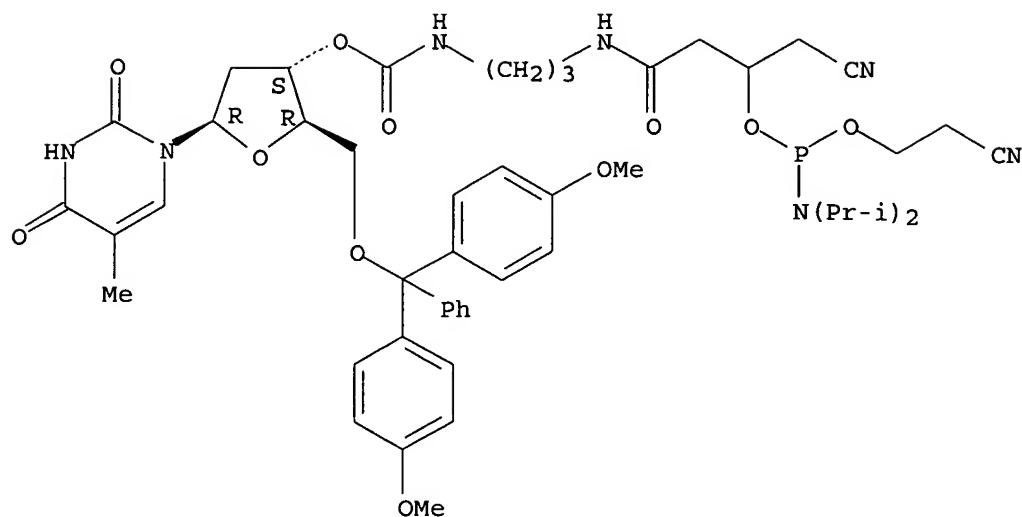
Absolute stereochemistry.



RN 794520-45-9 CAPLUS

CN Thymidine, 5'-O-[bis(4-methoxyphenyl)phenylmethyl]-, 3'-[11-[bis(1-methylethyl)amino]-14-cyano-9-(cyanomethyl)-7-oxo-10,12-dioxo-2,6-diaza-11-phosphatetradecanoate] (9CI) (CA INDEX NAME)

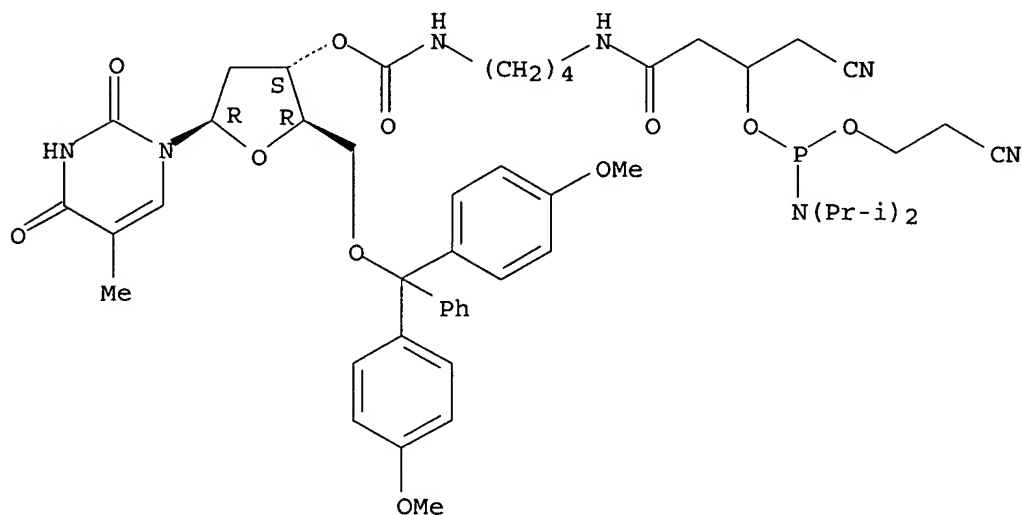
Absolute stereochemistry.



RN 794520-46-0 CAPLUS

CN Thymidine, 5'-O- [bis(4-methoxyphenyl)phenylmethyl]-, 3'-[12- [bis(1-methylethyl)amino]-15-cyano-10-(cyanomethyl)-8-oxo-11,13-dioxo-2,7-diaza-12-phosphapentadecanoate] (9CI) (CA INDEX NAME)

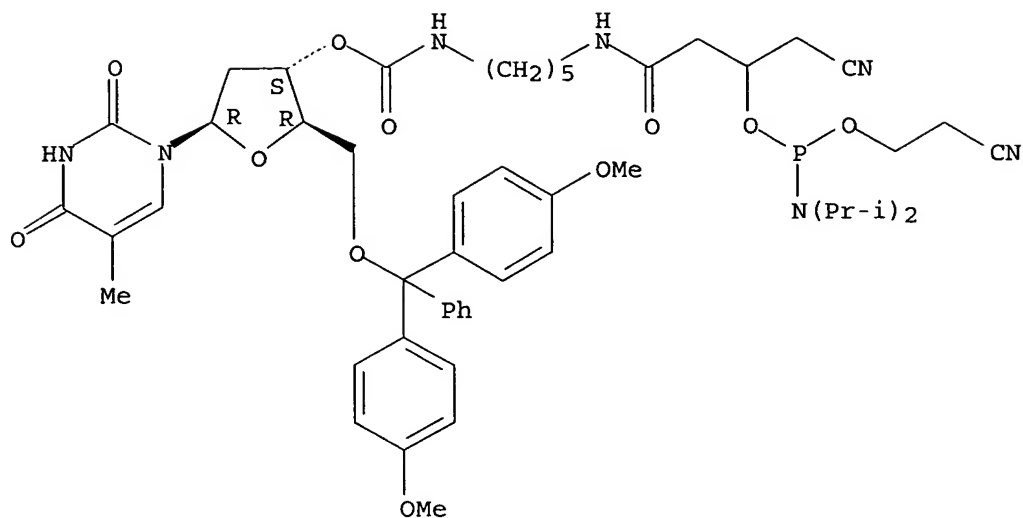
Absolute stereochemistry.



RN 794520-47-1 CAPLUS

CN Thymidine, 5'-O- [bis(4-methoxyphenyl)phenylmethyl]-, 3'-[13- [bis(1-methylethyl)amino]-16-cyano-11-(cyanomethyl)-9-oxo-12,14-dioxo-2,8-diaza-13-phosphahexadecanoate] (9CI) (CA INDEX NAME)

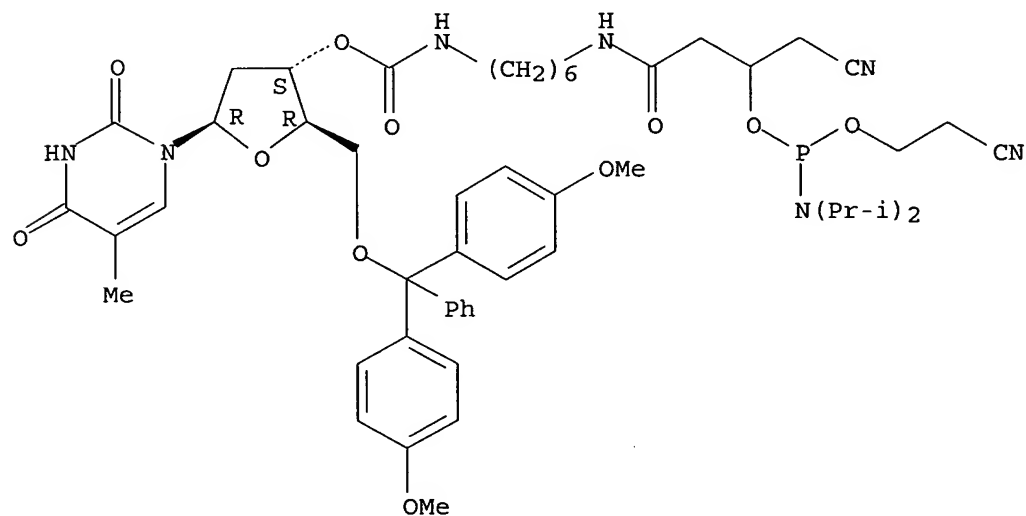
Absolute stereochemistry.



RN 794520-48-2 CAPLUS

CN Thymidine, 5'-O- [bis(4-methoxyphenyl)phenylmethyl]-, 3'-[14- [bis(1-methylethyl)amino]-17-cyano-12- (cyanomethyl)-10-oxo-13,15-dioxo-2,9-diaza-14-phosphaheptadecanoate] (9CI) (CA INDEX NAME)

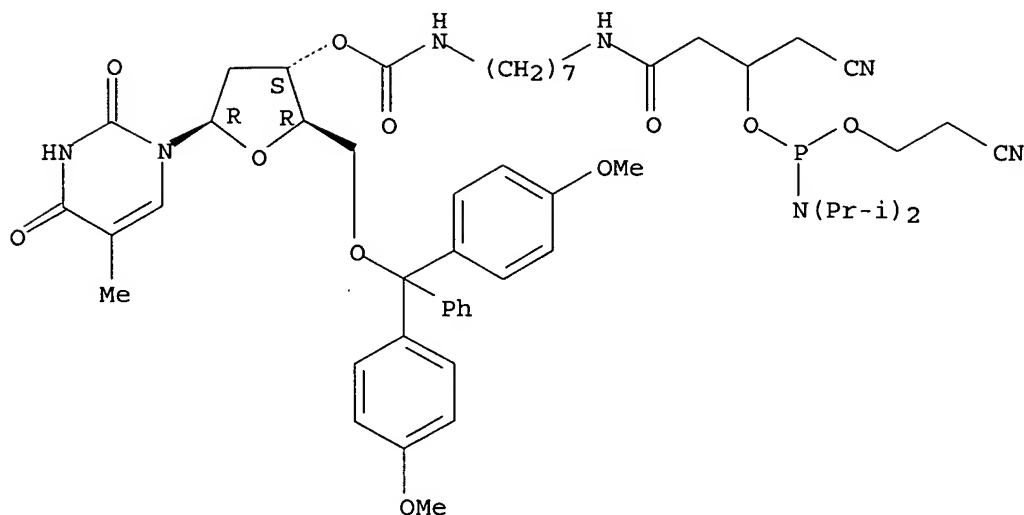
Absolute stereochemistry.



RN 794520-49-3 CAPLUS

CN Thymidine, 5'-O- [bis(4-methoxyphenyl)phenylmethyl]-, 3'-[15- [bis(1-methylethyl)amino]-18-cyano-13- (cyanomethyl)-11-oxo-14,16-dioxo-2,10-diaza-15-phosphaoctadecanoate] (9CI) (CA INDEX NAME)

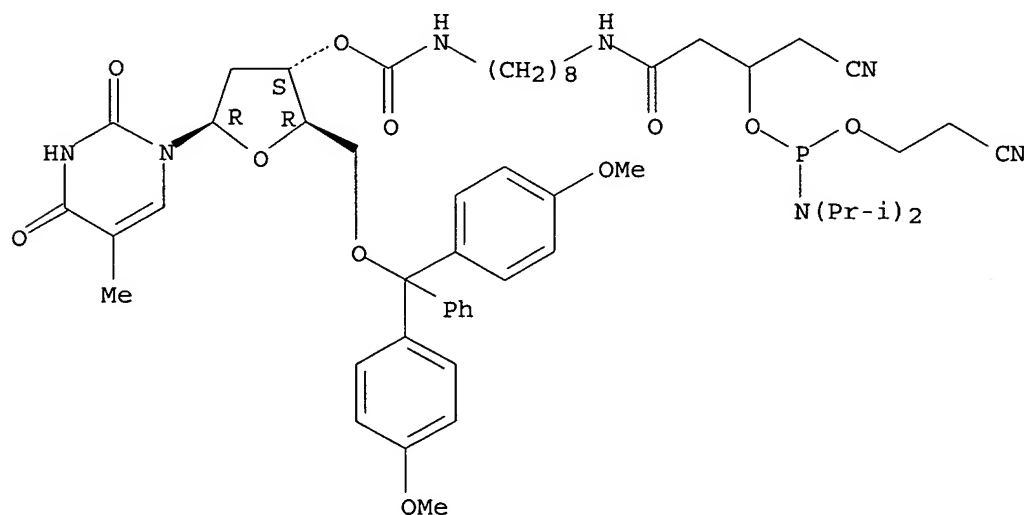
Absolute stereochemistry.



RN 794520-50-6 CAPLUS

CN Thymidine, 5'-O-[bis(4-methoxyphenyl)phenylmethyl]-, 3'-[16-[bis(1-methylethyl)amino]-19-cyano-14-(cyanomethyl)-12-oxo-15,17-dioxa-2,11-diaza-16-phosphanonadecanoate] (9CI) (CA INDEX NAME)

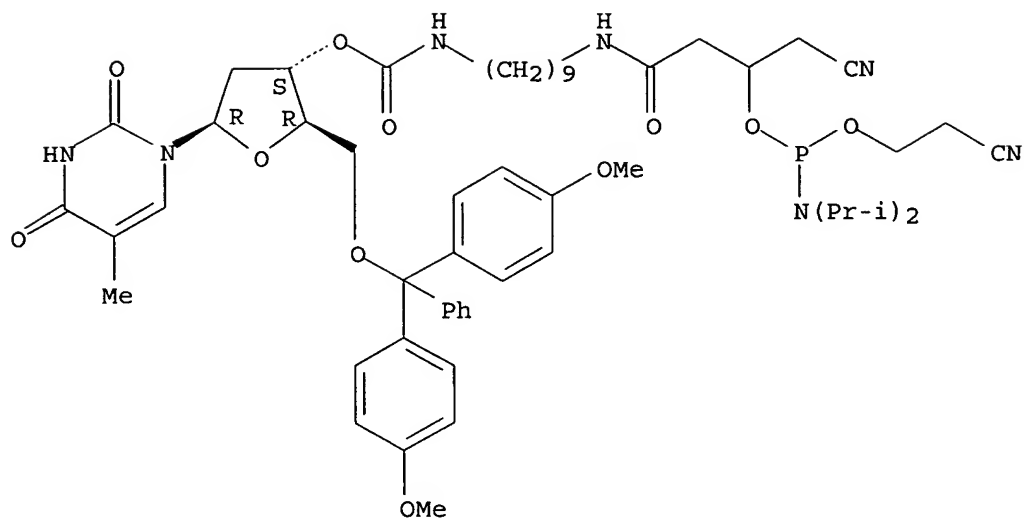
Absolute stereochemistry.



RN 794520-51-7 CAPLUS

CN Thymidine, 5'-O-[bis(4-methoxyphenyl)phenylmethyl]-, 3'-[17-[bis(1-methylethyl)amino]-20-cyano-15-(cyanomethyl)-13-oxo-16,18-dioxa-2,12-diaza-17-phosphaeicosanoate] (9CI) (CA INDEX NAME)

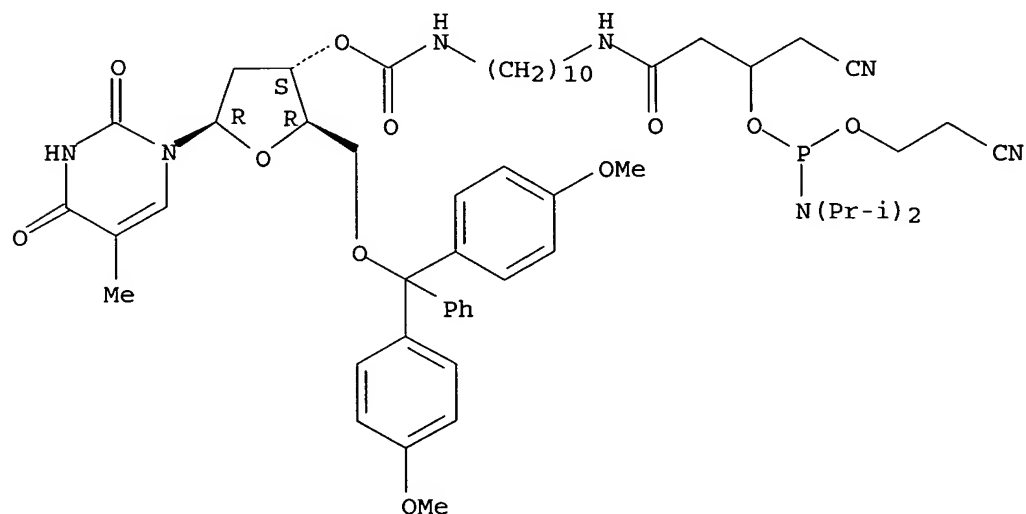
Absolute stereochemistry.



RN 794520-52-8 CAPLUS

CN Thymidine, 5'-O-[bis(4-methoxyphenyl)phenylmethyl]-, 3'-[18-[bis(1-methylethyl)amino]-21-cyano-16-(cyanomethyl)-14-oxo-17,19-dioxa-2,13-diaza-18-phosphaheneicosanoate] (9CI) (CA INDEX NAME)

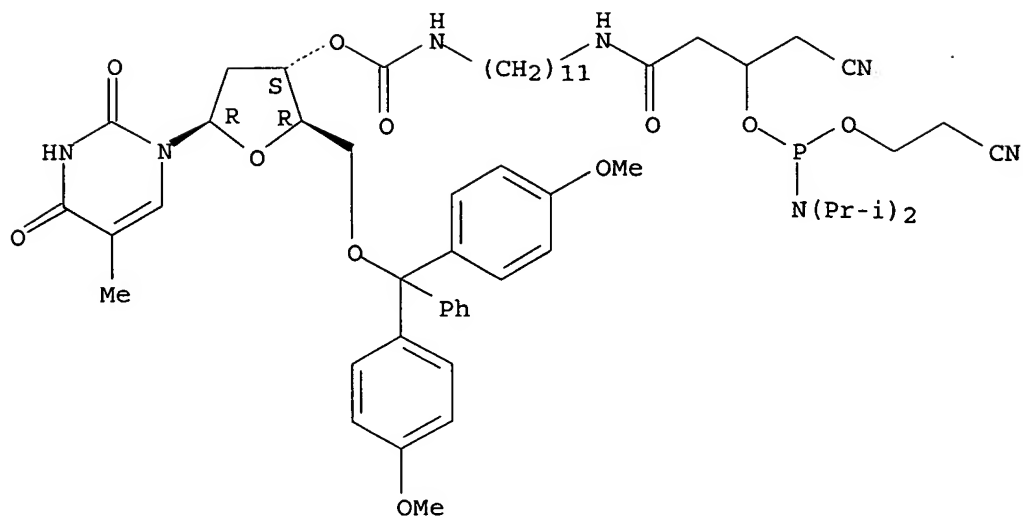
Absolute stereochemistry.



RN 794520-53-9 CAPLUS

CN Thymidine, 5'-O-[bis(4-methoxyphenyl)phenylmethyl]-, 3'-[19-[bis(1-methylethyl)amino]-22-cyano-17-(cyanomethyl)-15-oxo-18,20-dioxa-2,14-diaza-19-phosphadocosanoate] (9CI) (CA INDEX NAME)

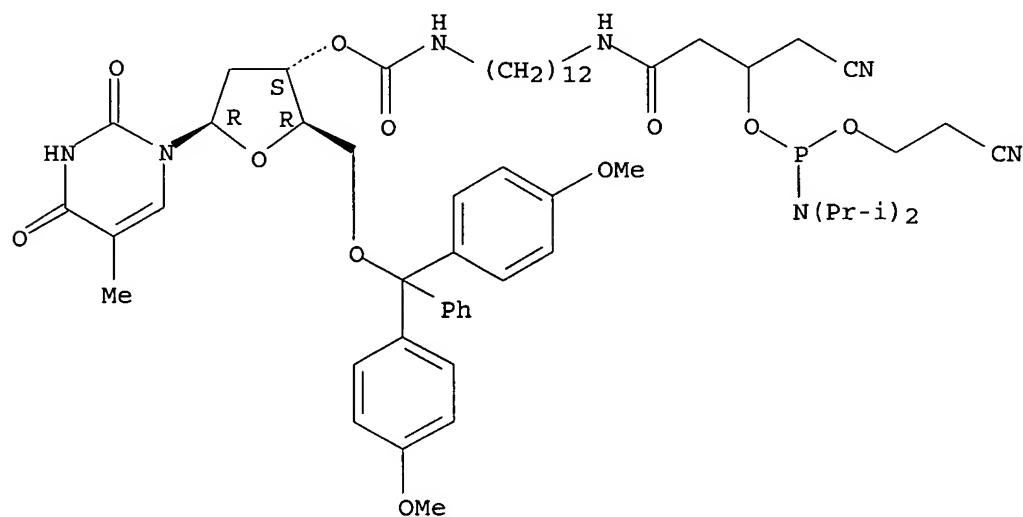
Absolute stereochemistry.



RN 794520-54-0 CAPLUS

CN Thymidine, 5'-O-[bis(4-methoxyphenyl)phenylmethyl]-, 3'-[20-[bis(1-methylethyl)amino]-23-cyano-18-(cyanomethyl)-16-oxo-19,21-dioxo-2,15-diaza-20-phosphatricosanoate] (9CI) (CA INDEX NAME)

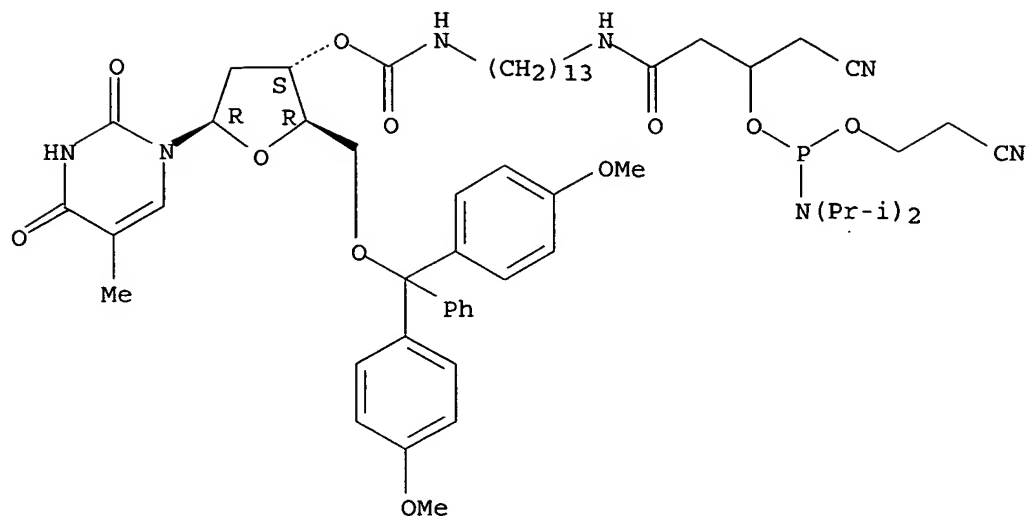
Absolute stereochemistry.



RN 794520-55-1 CAPLUS

CN Thymidine, 5'-O-[bis(4-methoxyphenyl)phenylmethyl]-, 3'-[21-[bis(1-methylethyl)amino]-24-cyano-19-(cyanomethyl)-17-oxo-20,22-dioxo-2,16-diaza-21-phosphatetracosanoate] (9CI) (CA INDEX NAME)

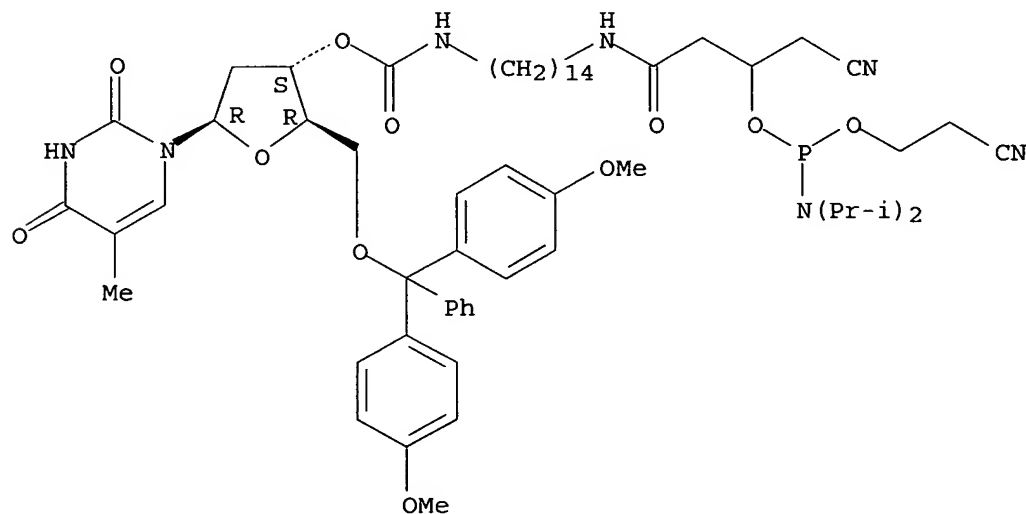
Absolute stereochemistry.



RN 794520-56-2 CAPLUS

CN Thymidine, 5'-O-[bis(4-methoxyphenyl)phenylmethyl]-, 3'-[22-[bis(1-methylethyl)amino]-25-cyano-20-(cyanomethyl)-18-oxo-21,23-dioxo-2,17-diaza-22-phosphapentacosanoate] (9CI) (CA INDEX NAME)

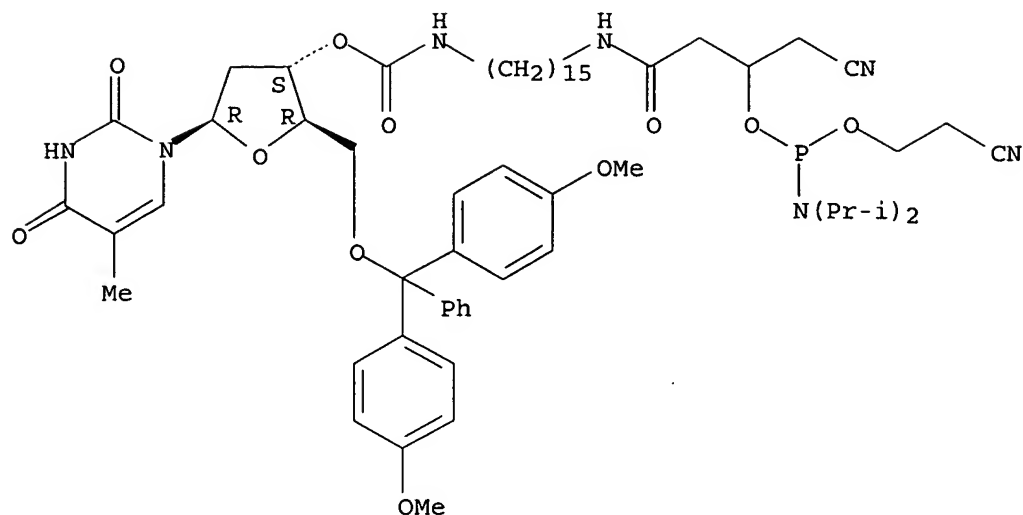
Absolute stereochemistry.



RN 794520-57-3 CAPLUS

CN Thymidine, 5'-O-[bis(4-methoxyphenyl)phenylmethyl]-, 3'-[23-[bis(1-methylethyl)amino]-26-cyano-21-(cyanomethyl)-19-oxo-22,24-dioxo-2,18-diaza-23-phosphahexacosanoate] (9CI) (CA INDEX NAME)

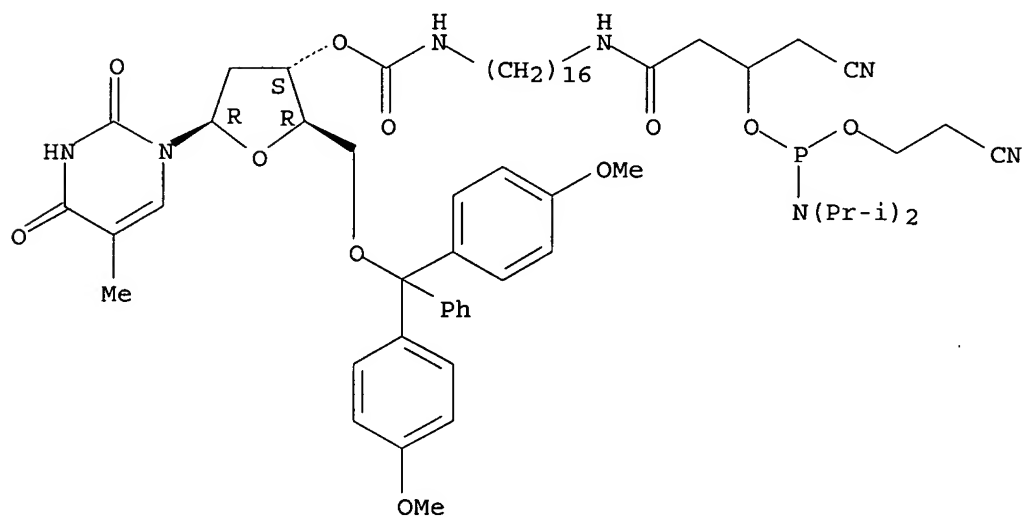
Absolute stereochemistry.



RN 794520-58-4 CAPLUS

CN Thymidine, 5'-O-[bis(4-methoxyphenyl)phenylmethyl]-, 3'-[24-[bis(1-methylethyl)amino]-27-cyano-22-(cyanomethyl)-20-oxo-23,25-dioxo-2,19-diaza-24-phosphaheptacosanoate] (9CI) (CA INDEX NAME)

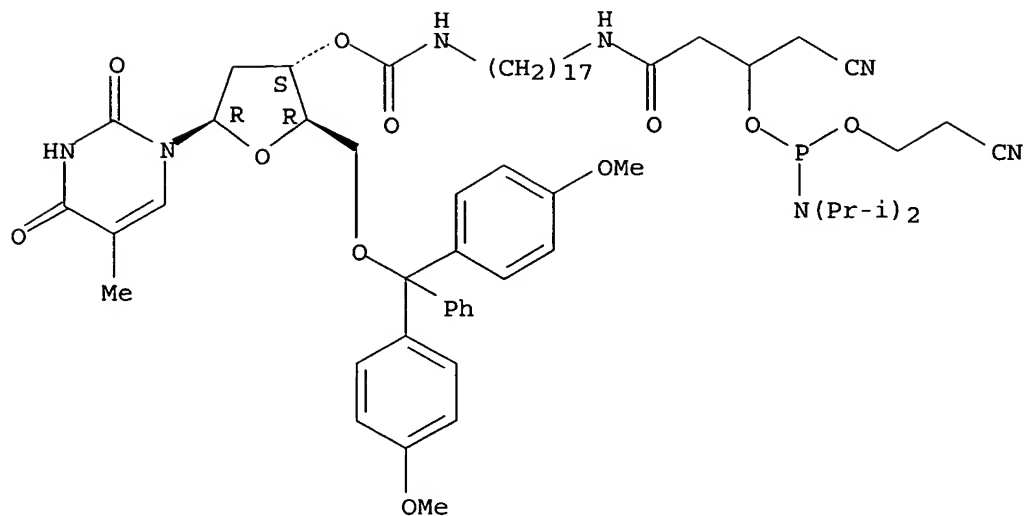
Absolute stereochemistry.



RN 794520-59-5 CAPLUS

CN Thymidine, 5'-O-[bis(4-methoxyphenyl)phenylmethyl]-, 3'-[25-[bis(1-methylethyl)amino]-28-cyano-23-(cyanomethyl)-21-oxo-24,26-dioxo-2,20-diaza-25-phosphaoctacosanoate] (9CI) (CA INDEX NAME)

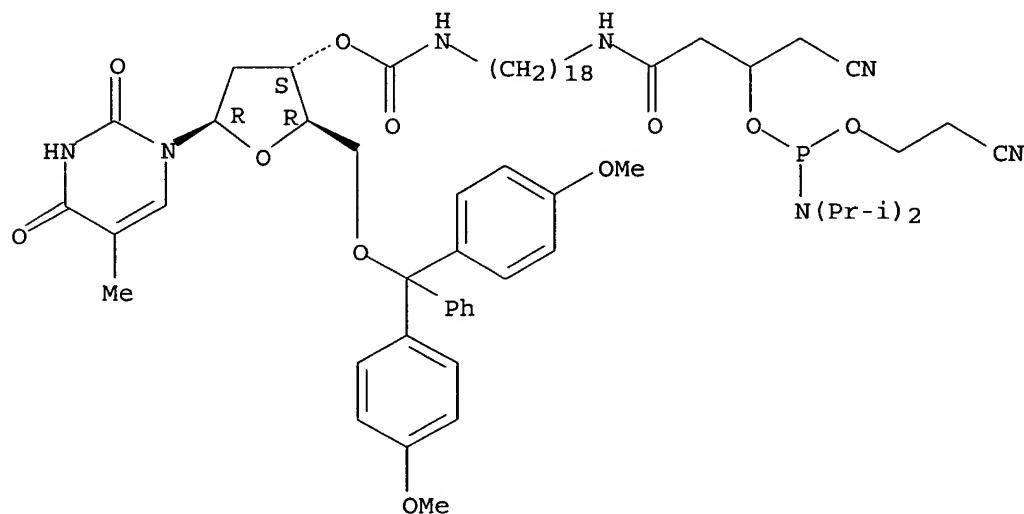
Absolute stereochemistry.



RN 794520-60-8 CAPLUS

CN Thymidine, 5'-O-[bis(4-methoxyphenyl)phenylmethyl]-, 3'-[26-[bis(1-methylethyl)amino]-29-cyano-24-(cyanomethyl)-22-oxo-25,27-dioxo-2,21-diaza-26-phosphanacanosanoate] (9CI) (CA INDEX NAME)

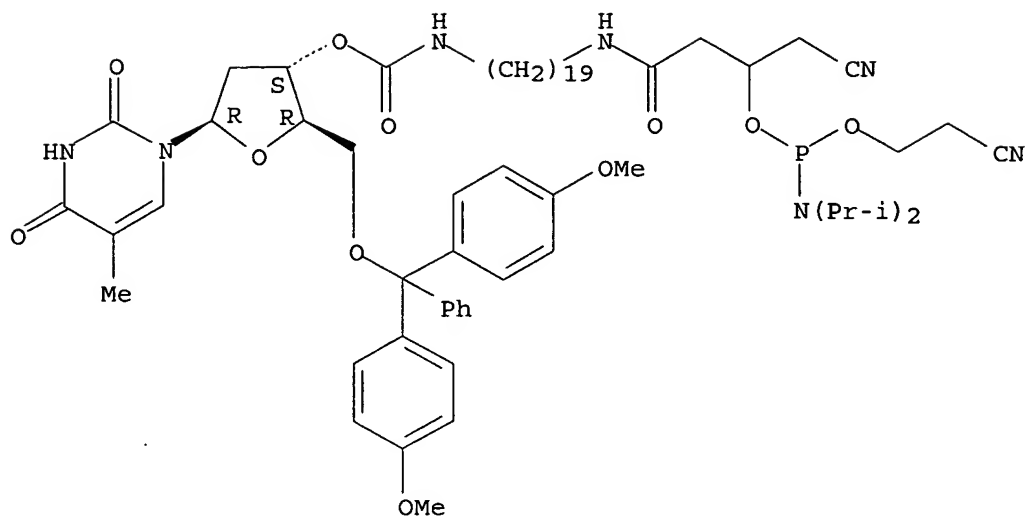
Absolute stereochemistry.



RN 794520-61-9 CAPLUS

CN Thymidine, 5'-O-[bis(4-methoxyphenyl)phenylmethyl]-, 3'-[27-[bis(1-methylethyl)amino]-30-cyano-25-(cyanomethyl)-23-oxo-26,28-dioxo-2,22-diaza-27-phosphatriacontanoate] (9CI) (CA INDEX NAME)

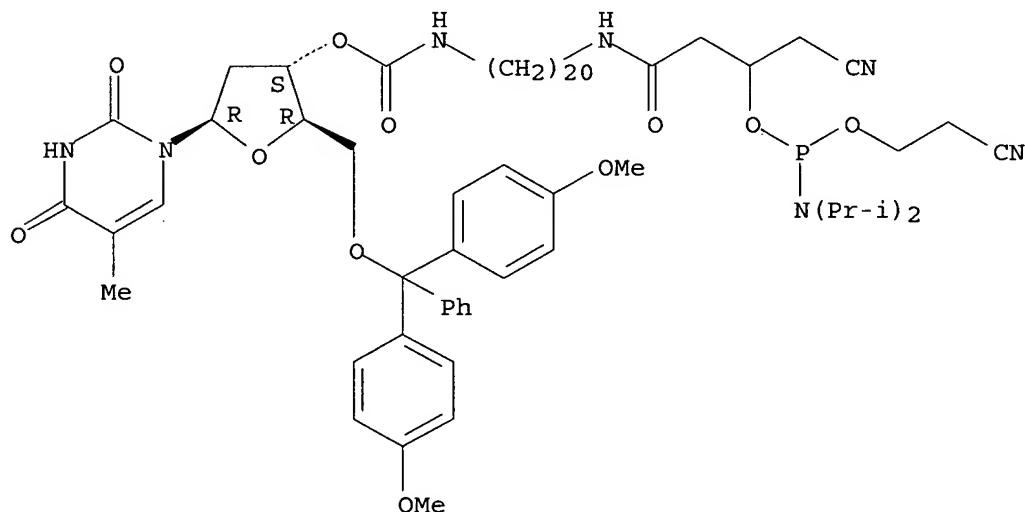
Absolute stereochemistry.



RN 794520-62-0 CAPLUS

CN Thymidine, 5'-O-[bis(4-methoxyphenyl)phenylmethyl]-, 3'-[28-[bis(1-methylethyl)amino]-31-cyano-26-(cyanomethyl)-24-oxo-27,29-dioxa-2,23-diaza-28-phosphahentriacontanoate] (9CI) (CA INDEX NAME)

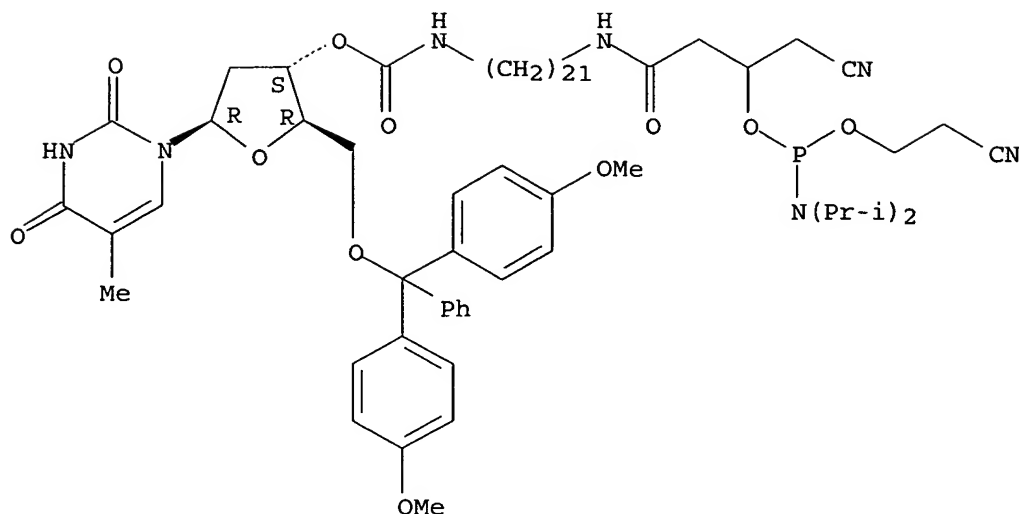
Absolute stereochemistry.



RN 794520-63-1 CAPLUS

CN Thymidine, 5'-O-[bis(4-methoxyphenyl)phenylmethyl]-, 3'-[29-[bis(1-methylethyl)amino]-32-cyano-27-(cyanomethyl)-25-oxo-28,30-dioxa-2,24-diaza-29-phosphahentriacontanoate] (9CI) (CA INDEX NAME)

Absolute stereochemistry.



L23 ANSWER 2 OF 5 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:977024 CAPLUS

DOCUMENT NUMBER: 140:253800

TITLE: A novel reagent for the chemical phosphorylation of oligonucleotides

AUTHOR(S): Leuck, Michael; Vagle, Kurt E.; Shawn Roach, J.; Wolter, Andreas

CORPORATE SOURCE: Proligo Biochemie GmbH Hamburg, Hamburg, D-21147, Germany

SOURCE: Tetrahedron Letters (2004), 45(2), 321-324

CODEN: TELEAY; ISSN: 0040-4039

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 140:253800

AB A novel phosphoramidite reagent was developed to convert terminal hydroxyl groups of oligonucleotides into phosphate monoesters. The reagent's appearance as a solid foam is advantageous for its manipulation and handling in solid-phase synthesis and improves its thermal stability.

IT 669013-14-3P

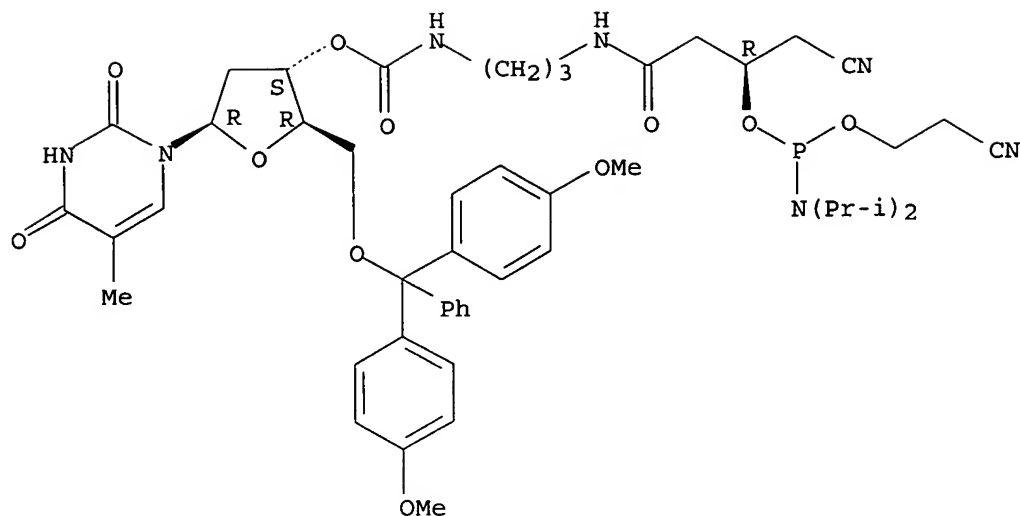
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(preparation of phosphate monoester oligonucleotides via phosphorylation of terminal hydroxyl groups in oligonucleotides)

RN 669013-14-3 CAPLUS

CN Thymidine, 5'-O-[bis(4-methoxyphenyl)phenylmethyl]-, 3'-[(9R)-11-[bis(1-methylethyl)amino]-14-cyano-9-(cyanomethyl)-7-oxo-10,12-dioxo-2,6-diaza-11-phosphatetradecanoate] (9CI) (CA INDEX NAME)

Absolute stereochemistry.



REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L23 ANSWER 3 OF 5 MARPAT COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 138:397888 MARPAT

TITLE: Oligonucleotides containing α -L-ribonucleosides, their synthesis and use in diagnosis and therapy

INVENTOR(S): Wengel, Jesper

PATENT ASSIGNEE(S): Exiqon A/S, Den.

SOURCE: PCT Int. Appl., 141 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003039523	A2	20030515	WO 2002-IB5080	20021105
WO 2003039523	A3	20031204		
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW			
RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			

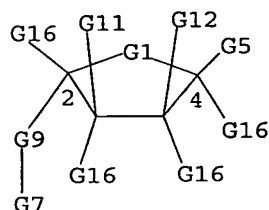
PRIORITY APPLN. INFO.: DK 2001-1640 20011105

US 2001-337447P 20011105

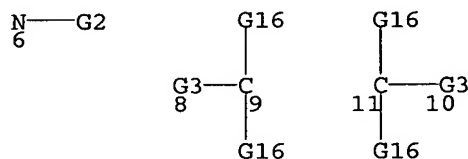
AB The invention relates to novel α -L-RNA monomers, which, when incorporated into an oligonucleotide impair a higher tendency towards hybridization with a RNA complement, as compared to a DNA complement. The invention also relates to a process for the preparation of an α -L-RNA

modified oligonucleotide and an intermediate for manufacturing the same. The novel oligonucleotides are useful for a variety of therapeutic, diagnostic, and general mol. biol. applications. Thus, oligonucleotides comprising α -L-RNA monomers sometimes exhibited lower hybridization tendencies with DNA than with RNA. The hybridization efficiency may be increased by incorporating LNA monomers into the oligonucleotide. Introduction of α -L-RNA monomers in oligonucleotides increased their resistance to nucleases.

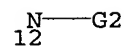
MSTR 1



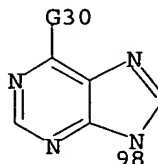
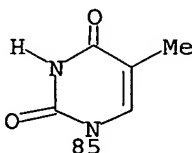
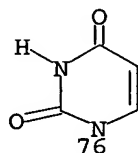
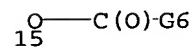
G1 = O / S / S(O) / SO₂ / 6 / 8-2 9-4 / 11-2 10-4 /
G19

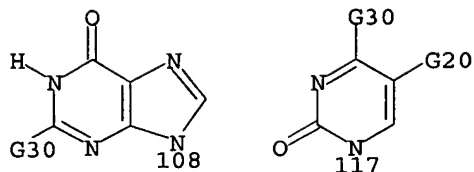


G2 = alkyl <containing 1-4 C> / H
G3 = O / S / 12

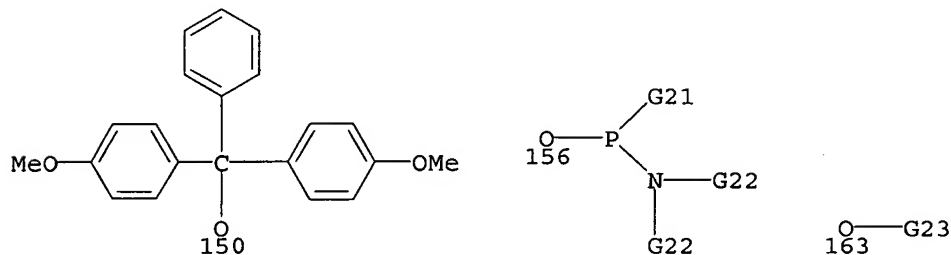


G5 = H / OH / alkoxy <containing 1-4 C> (opt. substd.) /
alkyl <containing 1-4 C> (opt. substd.) / 15 /
R <"optionally protected nucleobases, DNA intercalators,
photochemically active groups,
thermochemically active groups, chelating groups,
reporter groups, or ligands"> / (Specifically claimed: 76 /
85 / 98 / 108 / 117)

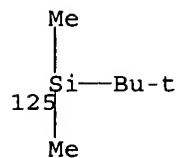




- G6 = carbon chain <containing 1-4 C> (opt. substd.) / H / R
 G7 = R <"nucleotide or oligonucleotide residue"> / R /
 H / alkyl <containing 1-12 C> (opt. substd.) /
 alkenyl <containing 2-12 C> (opt. substd.) /
 alkynyl <containing 2-12 C> (opt. substd.) / OH / 59 / 46 /
 alkylcarbonyl <containing 1-12 C> / aryl (opt. substd.) /
 heteroaryl (opt. substd.) / NH2 /
 alkylamino <containing 1-6 C> /
 dialkylamino <each alkyl containing 1-6 C> /
 alkylcarbonylamino <containing 1-6 C> / 23 / 26 / NO2 / N3 /
 SH / alkylthio <containing 1-6 C> / F / Cl / Br / I / 156 /
 (Specifically claimed: OPO3H2 / OP2O6H3 / OP3O9H4 / 150 / 163)



- G8 = R <"protecting group"> /
 (Specifically claimed: alkyl <containing 1-6 C> /
 trialkylsilyl <each alkyl containing 1-6 C> / 125)

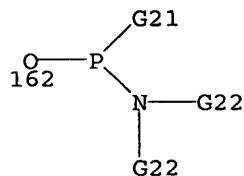


- G9 = CH2 / carbon chain <containing 1 or more C,
 0 or more double bonds, 0 or more triple bonds>
 (opt. substd. by 1 or more G10)
 G10 = OH / 48 / alkylcarbonyl <containing 1-12 C> /
 aryl (opt. substd.) / heteroaryl (opt. substd.) / 33 / NH2 /
 alkylamino <containing 1-6 C> /
 dialkylamino <each alkyl containing 1-6 C> /
 alkylcarbonylamino <containing 1-6 C> / 28 / 31 / NO2 / N3 /

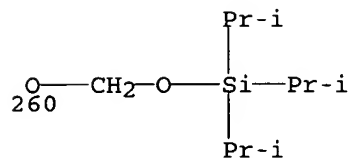
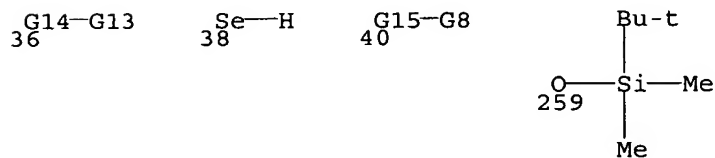
SH / alkylthio <containing 1-6 C> / F / Cl / Br / I



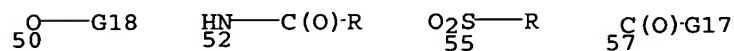
G11 = R <"nucleotide or oligonucleotide residue"> / R /
H / 162



G12 = F / Cl / Br / I / 36 / 38 / NH2 /
alkylamino <containing 1-4 C> /
dialkylamino <each alkyl containing 1-4 C> / OH / SH / 40 /
alkoxy <containing 1-12 C> (opt. substd.) /
alkenyloxy <containing 2-12 C> (opt. substd.) /
(Specifically claimed: 260 / 259)

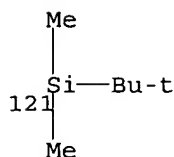


G13 = alkyl <containing 1-6 C> / Ph
G14 = S / Se
G15 = O / S
G16 = H / alkyl <containing 1-12 C> (opt. substd.) /
alkenyl <containing 2-12 C> (opt. substd.) /
alkynyl <containing 2-12 C> (opt. substd.) / OH / 57 /
alkylcarbonyl <containing 1-12 C> / aryl (opt. substd.) /
heteroaryl (opt. substd.) / 50 / NH2 /
alkylamino <containing 1-6 C> /
dialkylamino <each alkyl containing 1-6 C> /
alkylcarbonylamino <containing 1-6 C> / 52 / 55 / NO2 / N3 /
SH / alkylthio <containing 1-6 C> / F / Cl / Br / I

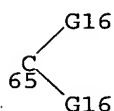


G17 = OH / alkoxy <containing 1-12 C> / H /

aryloxy (opt. substd.) / aryl (opt. substd.) /
 heteroaryloxy (opt. substd.) / heteroaryl (opt. substd.) /
 NH₂ / alkylamino <containing 1-6 C> /
 dialkylamino <each alkyl containing 1-6 C> /
 alkylamino <containing 1-6 C> (substd. by NH₂)
 G18 = alkyl <containing 1-12 C> /
 alkenyl <containing 2-12 C> / aryl (opt. substd.) /
 heteroaryl (opt. substd.) / R <"protecting group"> /
 alkylcarbonyl <containing 1-6 C> /
 alkylsulfonyl <containing 1-6 C> /
 (Specifically claimed: alkyl <containing 1-6 C> /
 trialkylsilyl <each alkyl containing 1-6 C> / 121)

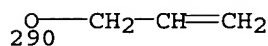
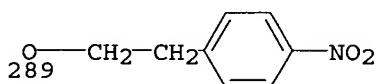
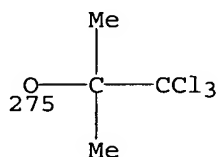
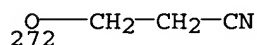


G19 = (1-2) 65



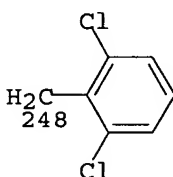
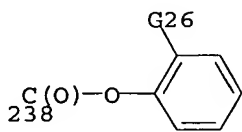
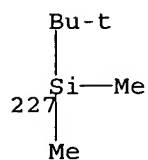
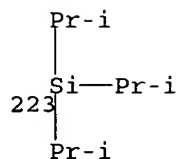
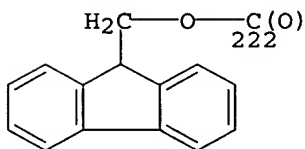
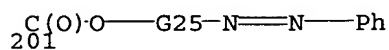
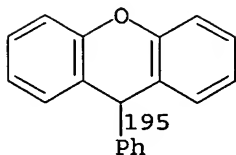
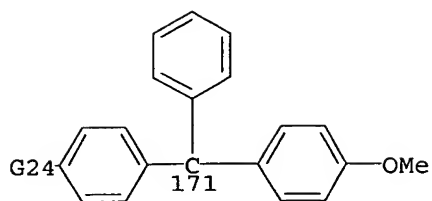
G20 = H / Me

G21 = R <"protecting group"> /
 (Specifically claimed: 272 / 275 / 289 / 290 / OMe / SMe)

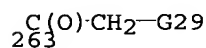


G22 = alkyl <containing 1-6 C> (opt. substd.) /
 alkenyl <containing 2-6 C> (opt. substd.)

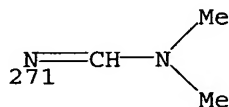
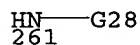
G23 = 171 / 195 / CO₂Et / 201 /
 2-tetrahydropyranyl (opt. substd. by OMe) / 222 / SiMe₃ /
 223 / 227 / 238 / Bu-t / Me / COMe (opt. substd. by 1 or
 more G27) / COCHMe₂ / COCMe₃ / CPh / CH₂OMe / 248



G24 = H / OMe
 G25 = phenylene
 G26 = H / Br
 G27 = Cl / F
 G28 = COMe / 263 / CPh



G29 = OPh (opt. substd. by Pr-i)
 G30 = NH2 / 261 / 271



Patent location: claim 1
 Note: additional oxo, thioxo, imino, methylene, double bond or ring formation also claimed
 Note: also incorporates claim 33

L23 ANSWER 4 OF 5 MARPAT COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 127:307622 MARPAT

TITLE: Preparation and MALDI-TOF mass spectra of of dinucleotide and oligodeoxyribonucleotide analogs

INVENTOR(S): Baxter, Anthony David; Baylis, Eric Keith; Collingwood, Stephen Paul; Fairhurst, Robin Alec; Taylor, Roger John

PATENT ASSIGNEE(S): Novartis A.-G., Switz.
 SOURCE: PCT Int. Appl., 142 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

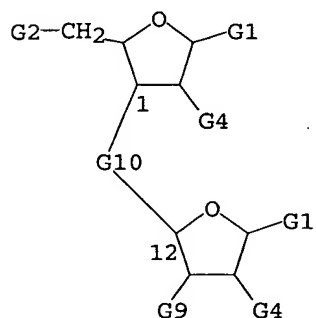
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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RW: GH, KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
AU 9721031	A1	19971017	AU 1997-21031	19970311
ZA 9702435	A	19971118	ZA 1997-2435	19970320
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PRIORITY APPLN. INFO.:			GB 1996-6158	19960323
			WO 1997-GB651	19970311

GI

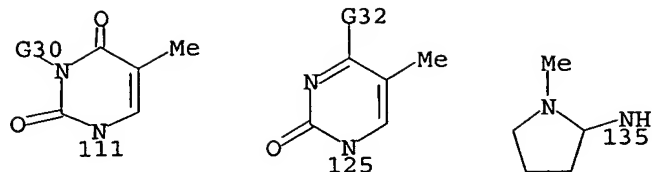
* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

AB Preparation and MALDI-TOF (matrix assisted laser desorption time-of-light) mass spectra of dinucleotide and oligodeoxyribonucleotide analogs I (B1 and B2 are independently nucleobase; R1 = H, hydroxy protecting group; R2 and R3 are independently H, halogen, OH, alkoxy; R4 = H, hydroxy protecting group, phosphoramidyl; R5 = H, halogen, alkyl; R6 = H, phosphoramidyl, hydroxy protecting group; Z = substituted chain containing carbon, nitrogen, and phosphorus) are reported. Thus, TTTRCTCTCTCTCT was prepared and its MALDI-TOF mass spectra is reported.

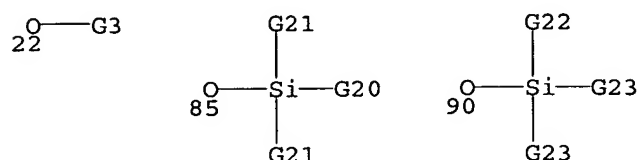
MSTR 1



G1 = R <"nucleoside base radicals"> /
 (Specifically claimed: 111 / 125 / 135)

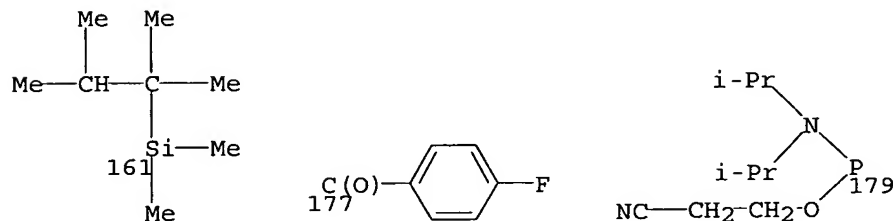
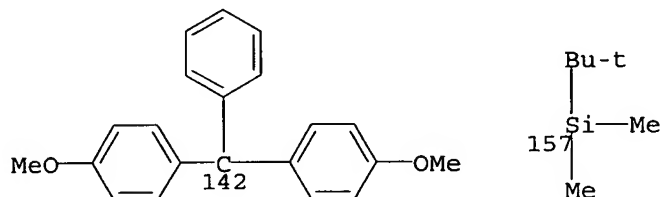


G2 = OH / 22 / (Specifically claimed: 85 / 90)



G3 = R <"protecting group"> /
 (Specifically claimed: carbon chain <containing 1-10 C>
 (opt. substd.) / carbocycle <containing 3-7 C, non-aromatic>
 (opt. substd.) / aryl <containing 6-10 C> (opt. substd.) /
 carbon chain <containing 1 or more C>
 (substd. by 1 or more G27) / 79 / 142 / 157 / 161 / CPh /
 177 / 179)

G17-G28
 79

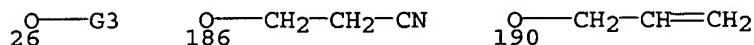


G4 = H / halo / OH / 24 / (Specifically claimed: alkoxy
 <containing 1-4 C> (opt. substd. by alkoxy <containing 1-4 C>
) / OMe)

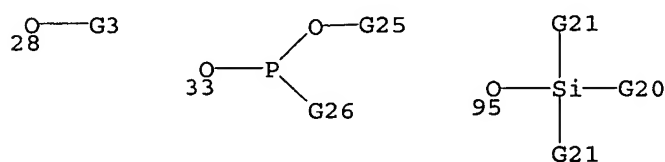
O-G3
 24

G5 = carbon chain (opt. substd. by 1 or more G8) / CH2
 G6 = R / (Specifically claimed: halo / OH /
 alkoxy <containing 1-4 C> / CN / NO2)
 G7 = aryl <containing 6-12 C>
 (opt. substd. by 1 or more G6) / R /

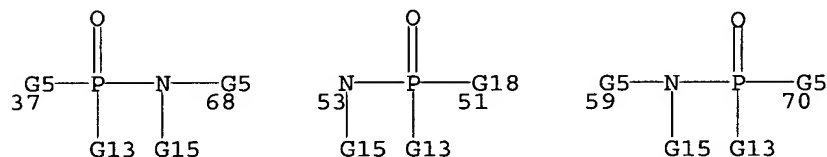
(Specifically claimed: halo / OH /
alkoxy <containing 1-4 C> / CN / NO₂)
G8 = halo / OH / 26 / carbocycle <containing 3-8 C,
non-aromatic> (opt. substd. by 1 or more G6) /
aryl <containing 6-10 C> (opt. substd. by 1 or more G6) /
(Specifically claimed: alkoxy <containing 1-4 C> / CN / NO₂
/
OMe / OEt / 186 / 190)



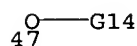
G9 = OH / 28 / 33 / (Specifically claimed: OCOPh (opt.
substd. by 1 or more halo) / 95)



G10 = 37-1 68-12 / 53-1 51-12 / 59-1 70-12



G13 = OH / carbon chain <containing 1-10 C>
(opt. substd. by 1 or more G6) /
carbocycle <containing 3-8 C, non-aromatic>
(opt. substd. by 1 or more G6) /
aryl <containing 6-10 C> (opt. substd. by 1 or more G6) /
carbon chain <containing 1-7 C> (substd. by 1 or more G7) /
47



G14 = carbon chain <containing 1-10 C>
(opt. substd. by 1 or more G6) /
carbocycle <containing 3-8 C, non-aromatic>
(opt. substd. by 1 or more G6) /
aryl <containing 6-10 C> (opt. substd. by 1 or more G6) /
carbon chain <containing 1-7 C> (substd. by 1 or more G7)
G15 = H / carbon chain <containing 1-10 C>
(opt. substd. by 1 or more G6) /
carbocycle <containing 3-8 C, non-aromatic>
(opt. substd. by 1 or more G6) /
aryl <containing 6-10 C> (opt. substd. by 1 or more G6) /
carbon chain <containing 1-7 C> (substd. by 1 or more G7) /
49 / (Specifically claimed: Me)

$\text{C}(\text{O})\text{-G14}$
49

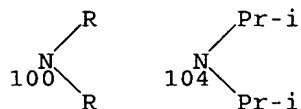
G17 = SO_2 / $\text{C}(\text{O})$
 G18 = carbon chain (opt. substd. by 1 or more G19)
 G19 = halo / 77 / aryl (opt. substd. by 1 or more G6) /
 carbocycle <containing 3-8 C, non-aromatic>
 (opt. substd. by 1 or more G6) / R /
 (Specifically claimed: halo / OH /
 alkoxy <containing 1-4 C> / CN / NO_2)

$\text{O}-\text{G3}$
77

G20 = alkyl <containing 1-6 C>
 G21 = aryl <containing 6-8 C>
 G22 = alkyl <containing 2-10 C>
 G23 = alkyl <containing 1-4 C>
 G25 = R / (Specifically claimed: 96)

$\text{H}_2\text{C}-\text{CH}_2-\text{CN}$
96

G26 = 100 / (Specifically claimed: 104)

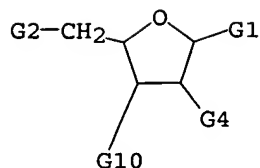


G27 = aryl <containing 6-39 C> (opt. substd.) / R
 G28 = carbon chain <containing 1-10 C> (opt. substd.) /
 carbocycle <containing 3-8 C, non-aromatic> (opt. substd.) /
 aryl <containing 6-10 C> (opt. substd.) /
 carbon chain <containing 1-7 C> (substd. by 1 or more G29)
 G29 = aryl <containing 6-12 C> (opt. substd.) / R
 G30 = H / CH_2OH / 116

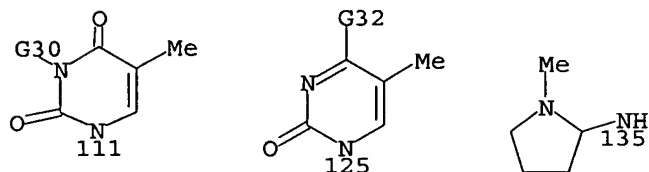
$\text{H}_2\text{C}-\text{O}-\text{CH}_2-\text{Ph}$
116

G32 = NH_2 / NHCOPh
 Patent location: claim 1

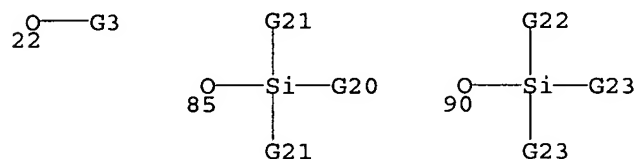
MSTR 2



G1 = R <"nucleoside base radicals"> /
(Specifically claimed: 111 / 125 / 135)

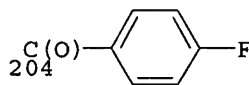
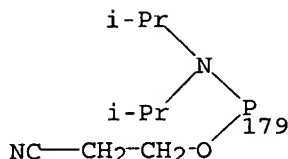
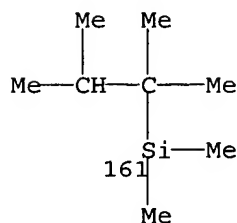
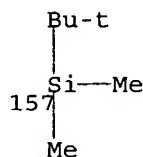
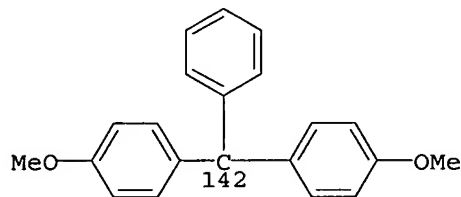


G2 = OH / 22 / (Specifically claimed: 85 / 90)



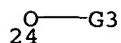
G3 = R <"protecting group"> /
(Specifically claimed: carbon chain <containing 1-10 C>
(opt. substd.) / carbocycle <containing 3-7 C, non-aromatic>
(opt. substd.) / aryl <containing 6-10 C> (opt. substd.) /
carbon chain <containing 1 or more C>
(substd. by 1 or more G27) / 79 / 142 / 157 / 161 / CPh /
204 / 179)

G17-G28
79

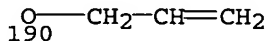
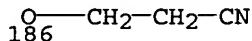


G4 = H / halo / OH / 24 / (Specifically claimed: alkoxy
<containing 1-4 C> (opt. substd. by alkoxy <containing 1-4 C>)

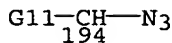
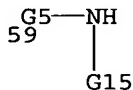
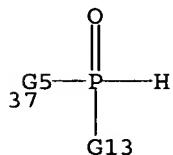
) / OMe)



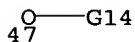
- G5 = carbon chain (opt. substd. by 1 or more G8) / CH2
 G6 = R / (Specifically claimed: halo / OH / alkoxy <containing 1-4 C> / CN / NO2)
 G7 = aryl <containing 6-12 C> (opt. substd. by 1 or more G6) / R / (Specifically claimed: halo / OH / alkoxy <containing 1-4 C> / CN / NO2)
 G8 = halo / OH / 26 / carbocycle <containing 3-8 C, non-aromatic> (opt. substd. by 1 or more G6) / aryl <containing 6-10 C> (opt. substd. by 1 or more G6) / (Specifically claimed: alkoxy <containing 1-4 C> / CN / NO2) / OMe / OEt / 186 / 190)



- G10 = 37 / N3 / 53 / 59 / 194



- G11 = H / halo / carbon chain <containing 1-10 C> (opt. substd. by 1 or more G6) / carbocycle <containing 3-8 C, non-aromatic> (opt. substd. by 1 or more G6) / aryl <containing 6-10 C> (opt. substd. by 1 or more G6) / carbon chain <containing 1-7 C> (substd. by 1 or more G7)
 G13 = OH / carbon chain <containing 1-10 C> (opt. substd. by 1 or more G6) / carbocycle <containing 3-8 C, non-aromatic> (opt. substd. by 1 or more G6) / aryl <containing 6-10 C> (opt. substd. by 1 or more G6) / carbon chain <containing 1-7 C> (substd. by 1 or more G7) / 47



- G14 = carbon chain <containing 1-10 C> (opt. substd. by 1 or more G6) / carbocycle <containing 3-8 C, non-aromatic> (opt. substd. by 1 or more G6) / aryl <containing 6-10 C> (opt. substd. by 1 or more G6) / carbon chain <containing 1-7 C> (substd. by 1 or more G7)
 G15 = H / carbon chain <containing 1-10 C>

(opt. substd. by 1 or more G6) /
 carbocycle <containing 3-8 C, non-aromatic>
 (opt. substd. by 1 or more G6) /
 aryl <containing 6-10 C> (opt. substd. by 1 or more G6) /
 carbon chain <containing 1-7 C> (substd. by 1 or more G7) /
 49 / (Specifically claimed: Me)

^{C(O)}G14
 49

G17 = SO₂ / C(O)
 G20 = alkyl <containing 1-6 C>
 G21 = aryl <containing 6-8 C>
 G22 = alkyl <containing 2-10 C>
 G23 = alkyl <containing 1-4 C>
 G27 = aryl <containing 6-39 C> (opt. substd.) / R
 G28 = carbon chain <containing 1-10 C> (opt. substd.) /
 carbocycle <containing 3-8 C, non-aromatic> (opt. substd.) /
 aryl <containing 6-10 C> (opt. substd.) /
 carbon chain <containing 1-7 C> (substd. by 1 or more G29)
 G29 = aryl <containing 6-12 C> (opt. substd.) / R
 G30 = H / CH₂OH / 116

H₂C—O—CH₂—Ph
 116

G32 = NH₂ / NHCOPh

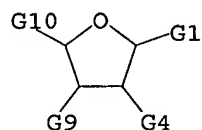
Patent location:

claim 10

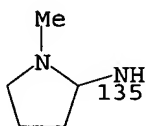
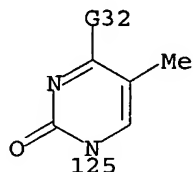
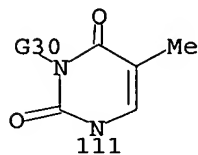
Note:

also incorporates claims 14, 16, 18 and 20

MSTR 3



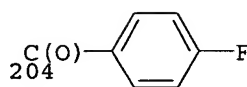
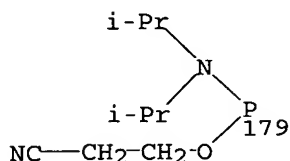
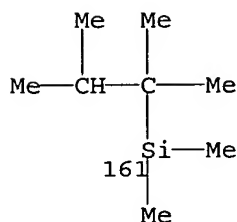
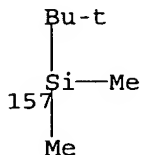
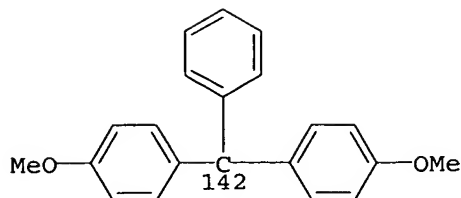
G1 = R <"nucleoside base radicals"> /
 (Specifically claimed: 111 / 125 / 135)



G3 = R <"protecting group"> /
 (Specifically claimed: carbon chain <containing 1-10 C>
 (opt. substd.) / carbocycle <containing 3-7 C, non-aromatic>
 (opt. substd.) / aryl <containing 6-10 C> (opt. substd.) /
 carbon chain <containing 1 or more C>

(substd. by 1 or more G27) / 79 / 142 / 157 / 161 / CPh /
179 / 204)

G17-G28
79



G4 = H / halo / OH / 24 / (Specifically claimed: alkoxy
<containing 1-4 C> (opt. substd. by alkoxy <containing 1-4 C>
) / OMe)

O-G3
24

G5 = carbon chain (opt. substd. by 1 or more G8) / CH2

G6 = R / (Specifically claimed: halo / OH /
alkoxy <containing 1-4 C> / CN / NO2)

G7 = aryl <containing 6-12 C>
(opt. substd. by 1 or more G6) / R /
(Specifically claimed: halo / OH /
alkoxy <containing 1-4 C> / CN / NO2)

G8 = halo / OH / 26 / carbocycle <containing 3-8 C,
non-aromatic> (opt. substd. by 1 or more G6) /
aryl <containing 6-10 C> (opt. substd. by 1 or more G6) /
(Specifically claimed: alkoxy <containing 1-4 C> / CN / NO2
/
OMe / OEt / 186 / 190)

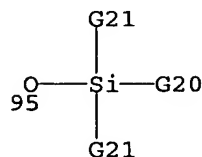
O-G3
26

O-CH2-CH2-CN
186

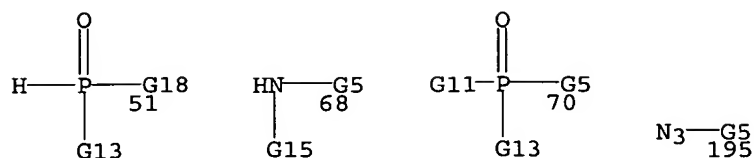
O-CH2-CH=CH2
190

G9 = OH / 28 / (Specifically claimed: OCOPh (opt.
substd. by 1 or more halo) / 95)

O-G3
28

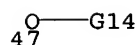


G10 = 195 / 68 / 51 / 70



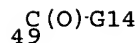
G11 = R <"protecting group">

G13 = OH / carbon chain <containing 1-10 C>
 (opt. substd. by 1 or more G6) /
 carbocycle <containing 3-8 C, non-aromatic>
 (opt. substd. by 1 or more G6) /
 aryl <containing 6-10 C> (opt. substd. by 1 or more G6) /
 carbon chain <containing 1-7 C> (substd. by 1 or more G7) /
 47



G14 = carbon chain <containing 1-10 C>
 (opt. substd. by 1 or more G6) /
 carbocycle <containing 3-8 C, non-aromatic>
 (opt. substd. by 1 or more G6) /
 aryl <containing 6-10 C> (opt. substd. by 1 or more G6) /
 carbon chain <containing 1-7 C> (substd. by 1 or more G7)

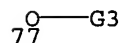
G15 = H / carbon chain <containing 1-10 C>
 (opt. substd. by 1 or more G6) /
 carbocycle <containing 3-8 C, non-aromatic>
 (opt. substd. by 1 or more G6) /
 aryl <containing 6-10 C> (opt. substd. by 1 or more G6) /
 carbon chain <containing 1-7 C> (substd. by 1 or more G7) /
 49 / (Specifically claimed: Me)



G17 = SO₂ / C(O)

G18 = carbon chain (opt. substd. by 1 or more G19)

G19 = halo / 77 / aryl (opt. substd. by 1 or more G6) /
 carbocycle <containing 3-8 C, non-aromatic>
 (opt. substd. by 1 or more G6) / R /
 (Specifically claimed: halo / OH /
 alkoxy <containing 1-4 C> / CN / NO₂)



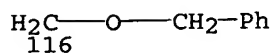
G20 = alkyl <containing 1-6 C>

G21 = aryl <containing 6-8 C>

G27 = aryl <containing 6-39 C> (opt. substd.) / R

G28 = carbon chain <containing 1-10 C> (opt. substd.) /
 carbocycle <containing 3-8 C, non-aromatic> (opt. substd.) /
 aryl <containing 6-10 C> (opt. substd.) /

carbon chain <containing 1-7 C> (substd. by 1 or more G29)
 G29 = aryl <containing 6-12 C> (opt. substd.) / R
 G30 = H / CH₂OH / 116



G32 = NH₂ / NHCOPh

Patent location:

claim 10

Note:

also incorporates claims 12, 14, 18 and 31

L23 ANSWER 5 OF 5 MARPAT COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 121:134804 MARPAT

TITLE: preparation of N-phosphonoamino acids

INVENTOR(S): Zhao, Yufen; Yin, Yingwu; Li, Yanmei

PATENT ASSIGNEE(S): Qinghua University, Peop. Rep. China

SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 42 pp.

CODEN: CNXXEV

DOCUMENT TYPE: Patent

LANGUAGE: Chinese

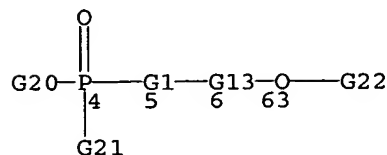
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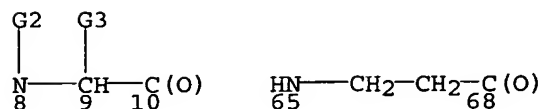
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1079473	A	19931215	CN 1993-100260	19930114
PRIORITY APPLN. INFO.:			CN 1993-100260	19930114

AB R1-(CH₂)_i[R2-(CH₂)_j]P(O)-NH-CH(R₈)-CO-[NH-CHR₄-CO]_n-OR₅ [R₈ = side-chain of natural or synthetic amino acid, e.g., that of alanine, arginine, etc.; n = 0-20; i, j = 0-30; R₁, R₂, R₅ = H, (un)substituted alkyl] are prepared via reaction of the appropriate amino acids or their esters with phosphite ester. E.g., α-alanine in aqueous EtOH was added to di-Me phosphite and Et₃N in CCl₄ and the resulting mixture was stirred for 4 h to give, after evaporation of the solvent and adjustment to pH 3 with 5-10% HCl, (MeO)₂P(O)-NH-CHMe-CO₂H.

MSTR 1



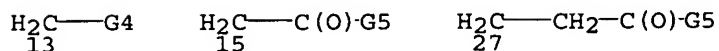
G1 = 8-4 10-6 / 65-4 68-6



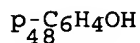
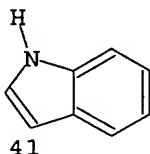
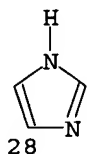
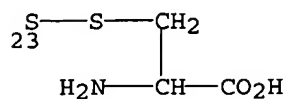
G2 = H

G3 = 13 / CH₂CH₂CH₂NHC(NH)NH₂ / 15 / 27 / H / Bu-s /

Bu-i / CH₂CH₂CH₂CH₂NH₂ / CH₂CH₂SMe / CH(OH)Me / Pr-i



G4 = H / SH / 23 / 28 / Ph / OH / 41 / 48

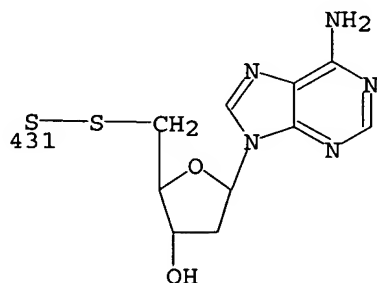
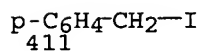


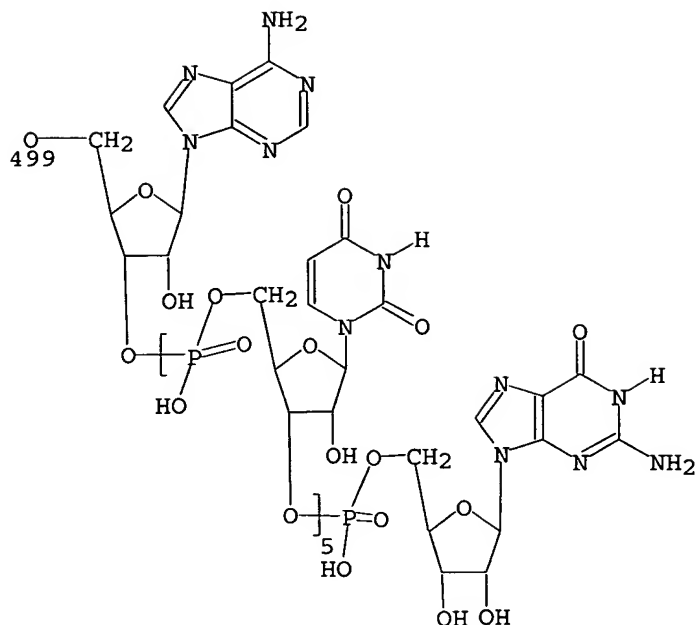
G5 = NH₂ / OH

G6 = OH / H

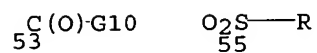
G7 = bond / alkylene <containing 1-30 C, unbranched>

G8 = H / alkyl (opt. substd. by 1 or more G9) /
cycloalkyl (opt. substd. by 1 or more G9) /
Ph (opt. substd. by 1 or more G11) /
R <"nucleotide, oligo-nucleotide, sterols,
polysaccharides and their derivatives"> / (Examples: 411 /
431 / 499)

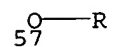




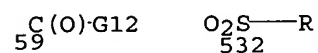
G9 = OH / halo / 53 / NO2 / 55 / (Example: SO3H)



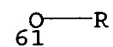
G10 = OH / R / H / 57



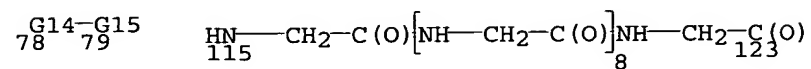
G11 = alkyl / OH / halo / 59 / NO2 / 532

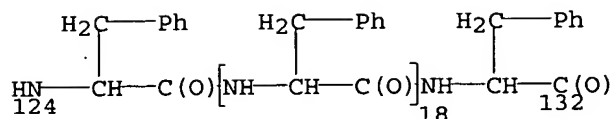


G12 = OH / H / 61

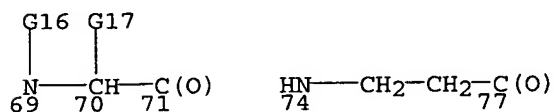


G13 = bond / 78-5 79-63 / (Examples: 115-5 123-63 / 124-5 132-63)

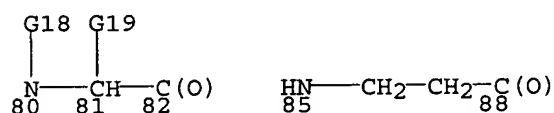




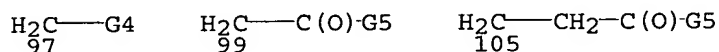
G14 = 69-5 71-79 / 74-5 77-79



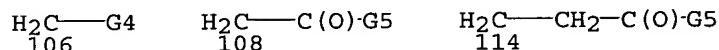
G15 = bond / 80-78 82-63 / 85-78 88-63



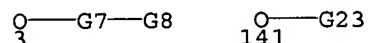
G16 = H
G17 = 97 / CH₂CH₂CH₂NHC(NH)NH₂ / 99 / 105 / H / Bu-s /
Bu-i / CH₂CH₂CH₂CH₂NH₂ / CH₂CH₂SMe / CH(OH)Me / Pr-i



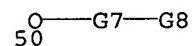
G18 = H
G19 = 106 / CH₂CH₂CH₂NHC(NH)NH₂ / 108 / 114 / H / Bu-s /
Bu-i / CH₂CH₂CH₂CH₂NH₂ / CH₂CH₂SMe / CH(OH)Me / Pr-i



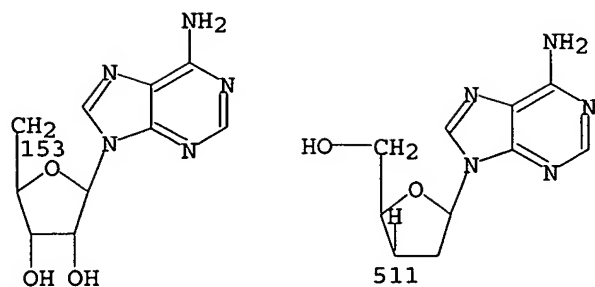
G20 = 3 / (Example: 141)



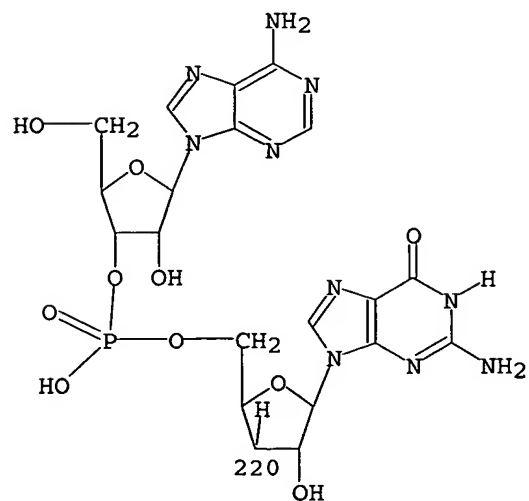
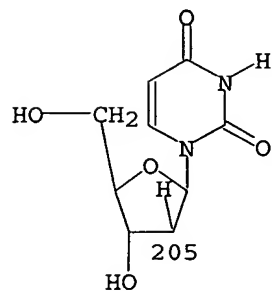
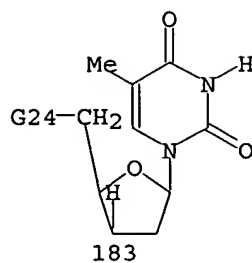
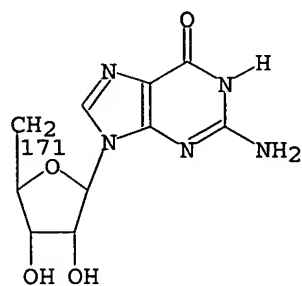
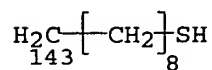
G21 = 50

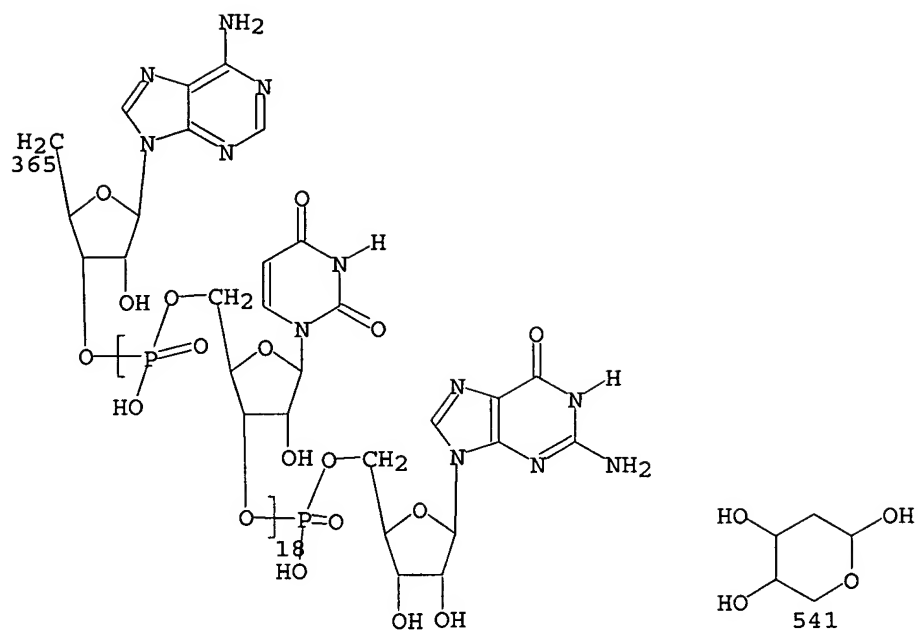


G22 = H / alkyl (opt. substd. by 1 or more G9) /
cycloalkyl (opt. substd. by 1 or more G9) /
Ph (opt. substd. by 1 or more G11) /
R <"nucleotide, oligo-nucleotide, sterols,
polysaccharides and their derivatives"> / (Examples: CH₂Ph /
153 / 511)

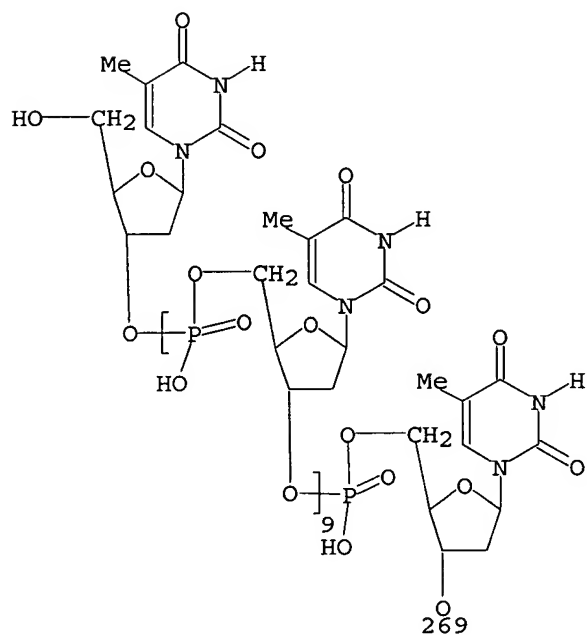


G23 = 143 / 171 / 183 / 205 / 220 / 365 / 541

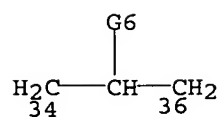




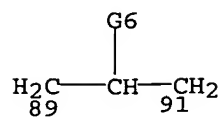
G24 = OH / 269



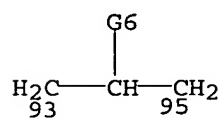
G2 + G3 = 34-8 36-9



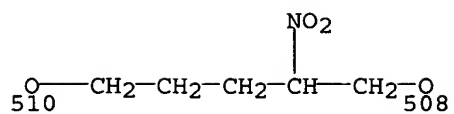
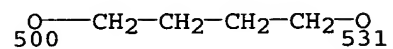
G16+G17= 89-69 91-70



G18+G19= 93-80 95-81



G20+G21= 500-4 531-4 / 510-4 508-4



Patent location:

claim 1